ORDER NO. MABR0302001C2

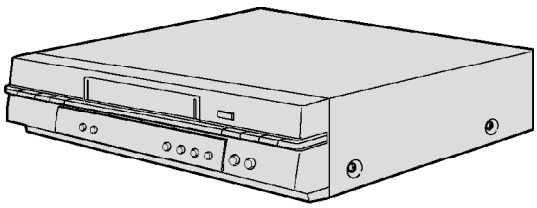
Service Manual

Video Cassette Recorder

Panasonic VHS Hi-Fi PAL

NV-HV65EC / NV-HV60EB / NV-HV60EBL / NV-HV60EC / NV-HV60EP / NV-HV55EC / NV-HV50EC

Z-MECHANISM



SPECIFICATIONS

SPECIFICATIONS

ITEM	SPECIFICATION		ITEM	SPECIFICATION
POWER	SOURCE: 220-240 V AC 50/60 Hz		VIDEO	OUTPUT: EURO AV (AV1/AV2) Connector (21 pin) 1.0 Vp-p, 75 Ω terminated
	CONSUMPTION: 18 watts COMSUMPTION WHEN IN STANDBY MODE: Approx. 3W (NV-HV65EC, 60EC/EP, 55EC, 50EC)		AUDIO	HEAD: 1 Stationary head (Normal-mono only) 2 channels (Hi-Fi Sound-Stereo)
RECORDING SYSTEM	2 rotary heads, helical scanning system			INPUT: EURO AV (AV1/AV2) Connector (21 pin) -6dBV (500mV), More than 10kΩ
	PAL			OUTPUT: EURO AV (AV1/AV2) Connector (21 pin) -6 dBV (500mV), Less than 1kΩ AUDIO OUT Connector (Phono type) -6 dBV (500mV), Less than 1kΩ (Except NV-HV50EC)
TV TUNER SYSTEM	NV-HV65EC NV-HV60EC NV-HV55EC NV-HV50EC	VHF: CHE2-CHE12 (PAL/SECAM B) UHF: CH21-CH69 (PAL/SECAM G) CATV: CHS01-CHS41 (PAL/SECAM B)	TAPE SPEED	SP: 23.39 mm/s LP: 11.695 mm/s EP: 7.796 mm/s Record/Playback Time: SP: 4 hours with 240 min. type tape LP: 8 hours with 240 min. type tape EP: 12 hours with 240min type tape FF/REW Time: 60 sec. with 180 min. type tape
	NV-HV60EB	UHF: CH21-CH68 (PAL I)		
	NV-HV60EBL	VHF: CHA-CHJ (PAL I) UHF: CH21-CH69 (PAL I) CATV: 104-470MHz (PAL I)		
	NV-HV60EP	VHF: CHE2-CHE12 (PAL/SECAM B) CHR1-CHR12 (SECAM D) UHF: CH21-CH69 (PAL/SECAM G, SECAM K, PAL I) CATV: CHS01-CHS41 (PAL/SECAM B) 44MHz-470MHz (SECAM B)		
RF OUT SYSTEM	NV-HV65EC NV-HV60EC NV-HV55EC NV-HV50EC	UHF: CH21-CH69 (PAL/SECAM G) 71 ± 3 dBμ, 75 Ω close	OPERATING TEMPERATURE	5°C - 40°C
	NV-HV60EB/EBL	UHF: CH21-CH68 (PAL I) 71 ± 3 dBμ, 75 Ω close	OPERATING HUMIDITY	35% - 80%
	NV-HV60EP	UHF: CH21-CH69 (PAL/SECAM G, SECAM K, PAL I) 71 ± 3 dBμ, 75 Ω close	DIMENSIONS	430 (W)×87(H)×282(D) mm
			WEIGHT	3.5 kg
			STANDARD ACCESSORIES	1 pc. DIN-RF Cable 1 pc. AC Mains Lead 1 pc. Infra-red Remote Controller
			SOLDER	This model use lead free solder (PbF).
VIDEO	HEADS: 4 rotary heads 1 pair for recording and playback (L-R heads) 1 pair for trick play (L'-R' heads)			
	INPUT: EURO AV (AV1/AV2) Connector (21 pin) 1.0 Vp-p, 75 Ω terminated			

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

Panasonic

1. INTRODUCTION

1.1. INTRODUCTION

This service manual contains technical information which will allow service personnel to understand and service this model.
If the circuit is changed or modified, this information will be followed by supplementary service manual to be filed with original service manual.

Note:

1. **Adjustment procedures, Disassembly Procedures and Assembly Procedures for Mechanism Chassis are separate volume from this service manual. / Please refer to the service manual for Z-Mechanism Chassis. (Order No. VRD9802005C2)**
2. **The Model No. is indicated on the Schematic Diagram and Circuit Board Diagrams as follows.**

Model No.	Indication Mark
NV-HV65EC	(A)
NV-HV60EB	(B)
NV-HV60EBL	(C)
NV-HV60EC	(A)
NV-HV60EP	(D)
NV-HV55EC	(A)
NV-HV50EC	(E)

1.2. ABOUT LEAD FREE SOLDER (PbF)

Distinction of PbF PCB:
PCBs (manufactured) using lead free solder will have a PbF stamp on the PCB.

Caution:

- Pb free solder has a higher melting point than standard solder, Typically the melting point is 50-70°F (30-40°C) higher. Please use

a high temperature soldering iron. In case of soldering iron with temperature control,please set it to 700±20°F (370±10°C)

- Pb free solder will tend to splash when heated too high (about 1100°F/600°C).

When soldering or unsoldering, please completely remove all of the solder on the pins or solder area, and be sure to heat the soldering points with the Pb free solder until it melts enough.

2. GENERAL DESCRIPTIONS

2.1. SERVICE CAUTION

2.1.1. REPLACING IC6002/EEPROM

When the EEPROM: IC6002 is replaced, applicable model code, option code and electrical adjustment data will not be available.
Therefore, enter and/or adjust the necessary data after replacing IC6002 by referring following procedure.

STEP1.REPLACE THE IC6002

1. Remove the C.B.A. with Mechanism unit by referring the Disassembly procedure.
2. Disconnect the AC plug and replace the IC6002.

STEP2.INPUT THE MODEL & OPTION CODE

1. Set up the applicable model code and option code by ordering the following table.

PROCEDURE	F.I.P. DISPLAY
Turn on the Service Mode **1.Press the FF key and the EJECT key simultaneously for more than 3 seconds.**	
Activate the Service Mode 2 **2.While keep placing FF key, press the EJECT key in twice.**	
Activate the Entering Mode. **3.Press the EJECT key for more than 3 seconds.**	
Set the Mode 2. **4.Press the CH UP key in twice.**	
Display the Setting Code. **5.Press the POWER key to turn the power on.**	 **(Colon starts flashing)**
Enter the Model and Option Code. **6.Service Screen is displayed on the monitor.** **7.Set the applicable Model and Option code by using REW, PLAY, STOP and FF keys on theRemote Controller. (See Fig.S1 & S2)**	
Exit from Service Mode. **8.Press the POWER key to turn the power off.** **9. Press FF and EJECT keys simultaneously in 6 times.**	 **(Normal Indication)**

Fig.S1 Service Screen (sample)

Service

MAIN	VLNC0.16	**
ACS	NONE	
Err	00	
MC	41h	
OC1	7Ch	
OC2	58h	
Clk	+ 34	
V/D	OFF	(depend)

Model No.	MC	OC1	OC2
NV-HV65EC NV-HV60EC	42h	7Ch	58h
NV-HV60EB	43h	5Ch	5Ch
NV-HV60EBL	44h	5Ch	5Ch
NV-HV60EP	46h	7Ch	58h
NV-HV55EC	42h	78h	58h
NV-HV50EC	42h	08h	50h

Fig. S2 Model Code & Option Code

NOTE:
Since all electrical adjustments data is still not available, perform the Electrical Adjustment continuously.

2.1.2. CYLINDER UNIT REPLACEMENT

1. CYLINDER UNIT REPLACEMENT

A. Remove the mechanism unit from MAIN C.B.A./Chassis by referring "SECTION 2. Disassembly Procedure".

B. Remove the 3 screws (A) of the CYLINDER UNIT with a screw driver.

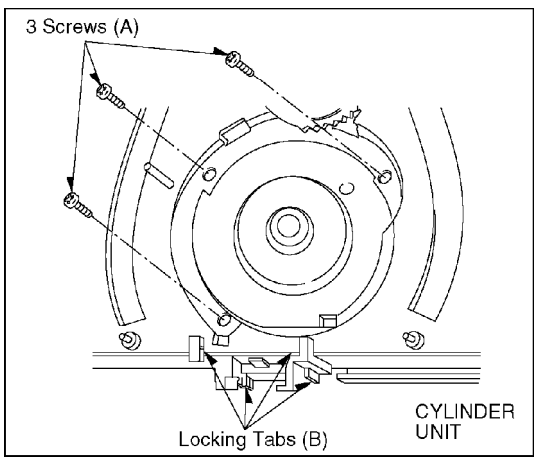
C. Unlock the 4 locking tabs (B) and disconnect the Cylinder flexible card from the FPC Holder.

D. Remove the CYLINDER UNIT.

CAUTION:

Handle the Cylinder flexible card with care. When it damaged, you should replace whole Cylinder unit.

Fig. S3



2. UPPER CYLINDER DISASSEMBLY

A. Remove 2 screws (A).

B. Remove the Cylinder Stator Unit.

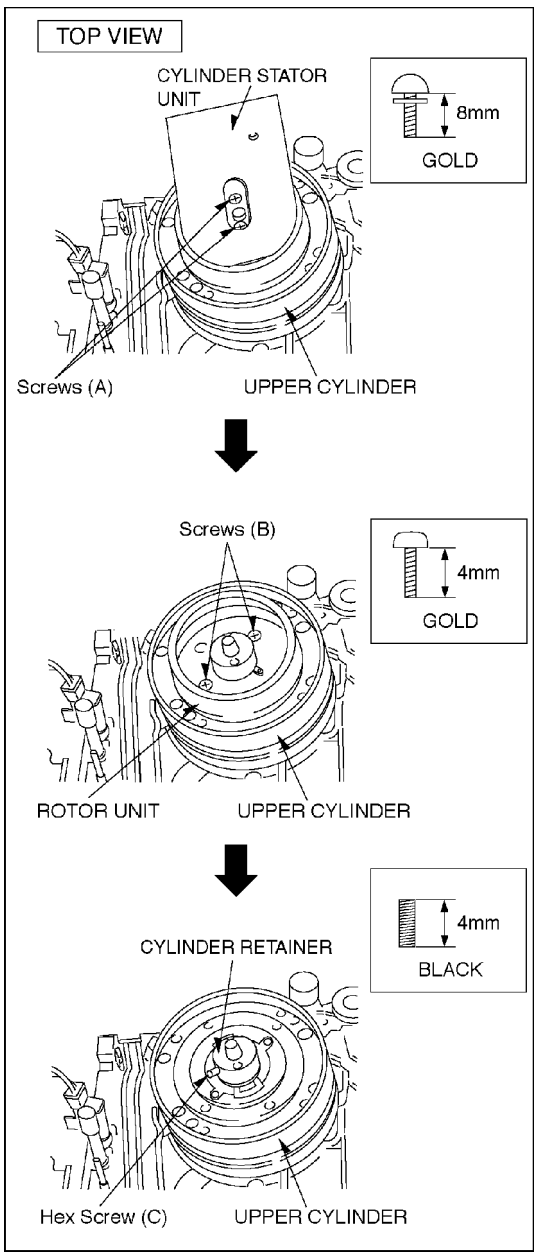
C. Remove 2 screws (B).

D. Remove the Cylinder Rotor Unit.

E. Loose Hex screw (C) (1.5 mm) and remove the CYLINDER RETAINER.

F. Remove the Upper Cylinder.

Fig. S4



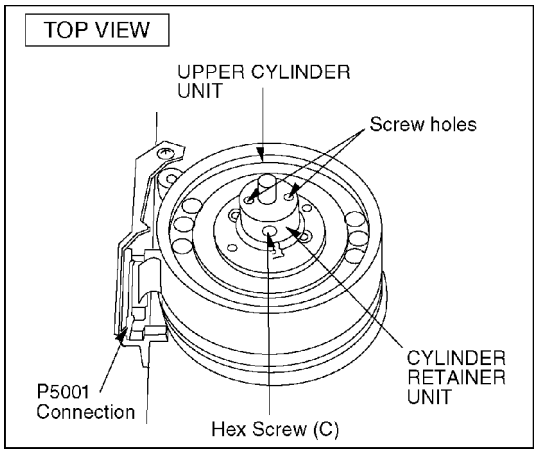
3. UPPER CYLINDER ASSEMBLY

When reassembling, perform the steps in the reverse order.

Notes:

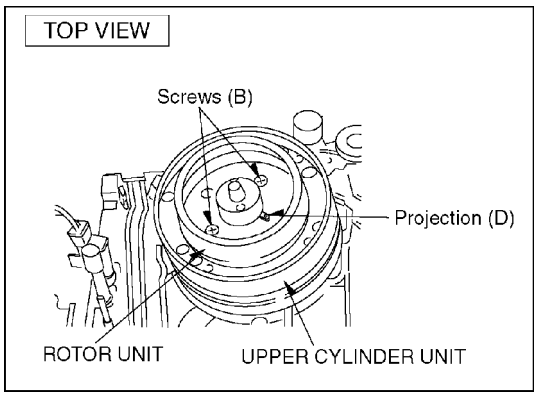
1. **Install the Cylinder Retainer so that the 2 holes on top of the Cylinder Retainer are at right angles with the P5001 Connection.**
2. **Tighten the Hex screw (C) (1.5 mm) while pressing down on top of the Cylinder Retainer.**

Fig. S5



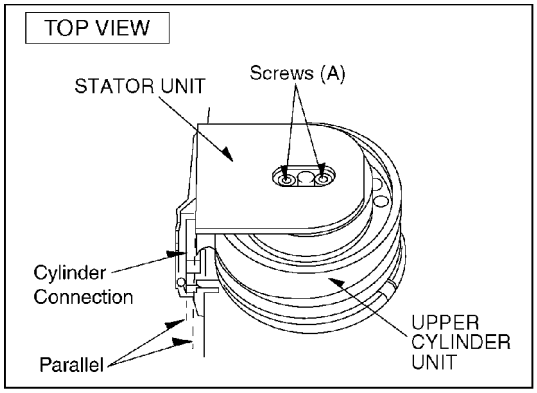
3. **Install the Cylinder Rotor Unit so that the inner hole of the Cylinder Rotor Unit fits to the small projection (D) on top of the Upper Cylinder.**
4. **Tighten 2 screws (B).**

Fig. S6



5. **install the Cylinder Stator Unit.**
6. **Tighten 2 screws (A).**

Fig. S7

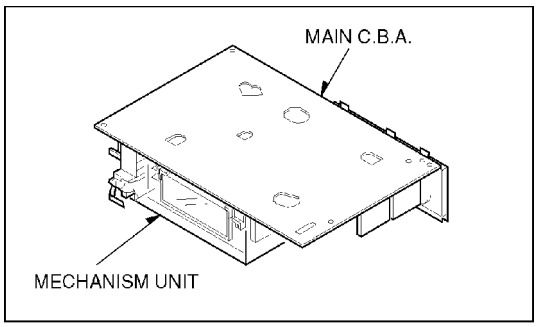


7. Confirm the PG SHIFTER ADJUSTMENT with the alignment tape (PAL: VFJ8125H3F) and adjust it if necessary.

2.1.3. CHECKING OF MAIN C.B.A.

When servicing the MAIN C.B.A., take out the MAIN C.B.A. and mechanism from the frame and turn over.

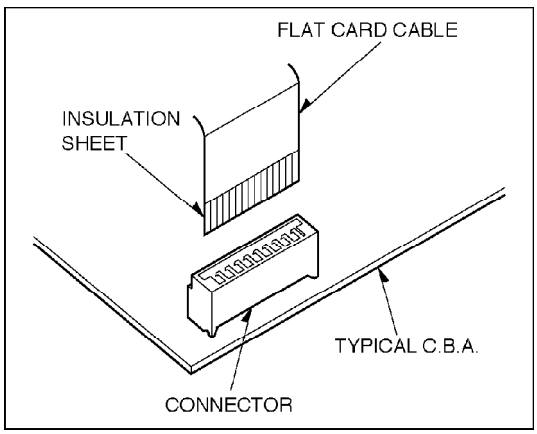
Fig. S8



2.1.4. FLAT CARD CABLE INSTALLATION

When installing the Flat Card Cable on the connector, install the Flat Card Cable with the cable contacts facing the connector contacts.

Fig. S9

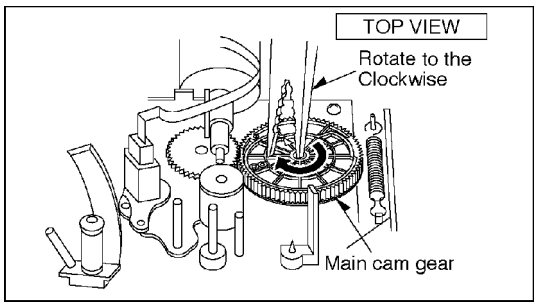


2.2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

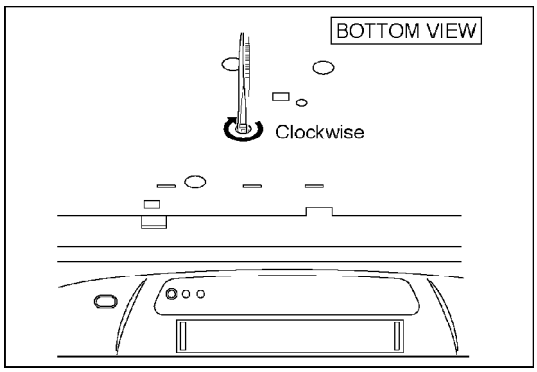
1. Service Information Display Operation
   A. Press the FF and EJECT keys simultaneosly for 3 seconds and set the Service Mode 7.
   B. Press STOP key in order to rotate the Loading Motor for unloading operation. (Pay an attention of tape slack)
2. Manual Operation
   A. Disconnect the AC Mains Lead and remove the Top Panel.
   B. Rotate the Main Cam Gear clockwise until the Loading Posts move to fully unloaded position as shown in Fig. S10 . (Tape is remaining)

Fig. S10



   C. Rotate the Capstan Motor clockwise from the bottom side to take up the tape.

Fig. S11



   D. Rotate the Main Cam Gear clockwise until the cassette tape is ejected.

2.3. INTRODUCTION OF VIDEO HEAD CLEANING CASSETTE / (POLISHING TYPE)

1. We are pleased to introduce Panasonic Video Head Cleaning Cassette, VFK0923FT [for service purposes] and VFK0923FSE [for end users] for all VHS/SVHS VCP and VCR.

2. **These cleaning cassettes are exclusive removing the hard and sticky clogging on video heads.**
3. **These improve the efficiency of video head cleaning service and shortening cleaning time for end users.**

VFK0923FT (For Service usage)	
Type of Cassette	**Full VHS Cassette**
Cleaning Time	**10 Seconds/Time**
Tape Length	**20 m**
Usability in a Path	**180 Times**

VFK0823FSE (For end users)	
Type of Cassette	**Full VHS Cassette**
Cleaning Time	**10 Seconds/Time**
Tape Length	**3.34 m**
Usability in a Path	**30 Times**

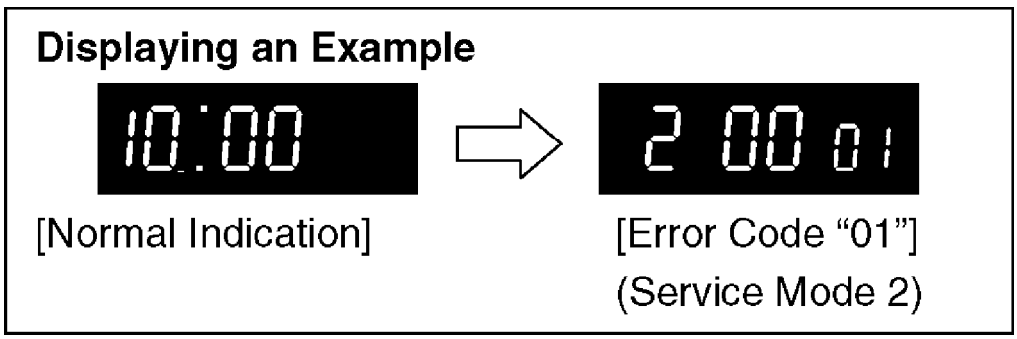
VFK0823FSE (For end users)

Note:

The tape material itself is the same in both types.

2.4. SELF-DIAGNOSIS RESULT DISPLAY

The "SELF-DIAGNOSIS RESULT DISPLAY & MEMORY function is built in this VTR.
It means that when the VCR detects undesirable condition, it can be displayed a “Error code (Two numbers from the right)” with Service Mode 2.
Since the "Error code" is stored in the EEPROM, it can be displayed although after disconnected the AC leads. It can be displayed with Service Mode 2.
(If a second error had been detected, only the most recent error is displayed.)
For more details, refer to the Service Manual for Z-Mechanism Chassis Order number VRD9802005C2.



INDICATION	CAUSE	REMEDY/CHECK
01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.	Check the cylinder motor drive circui
02	Cassette tape is not wound up during the tape unloading except EJECT mode.	Check the capstan motor drive circui
03	Mechanism locks during mode transition except EJECT mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment. 3. Check the mode switch.
04	Mechanism locks during tape unloading.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment.
06	Mechanism locks after tape unloading in EJECT mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment for cass
07	During recording mode, recording signal is less than the normal condition.	Protection of the over-current flowin transistor which produces the power for recording mode.
08	Recording circuit works except recording mode.	Check the recording circuit.
16	Cylinder lock detection.	Check the cylinder unit and the cylin drive circuit.
17	Supply reel mechanism lock detection	Check the supply reel mechanism an supply reel circuit.
18	Take-up reel mechanism lock detection	Check the Take-up reel mechanism a Take-up reel circuit.
2*	PG shifter automatic adjustment error.	Check the servo/system control circu cylinder unit.

Fig. T1 Self-Test indication Display

2.5. CAUTION FOR AC MAINS LEAD (NV-HV60EB/EBL)

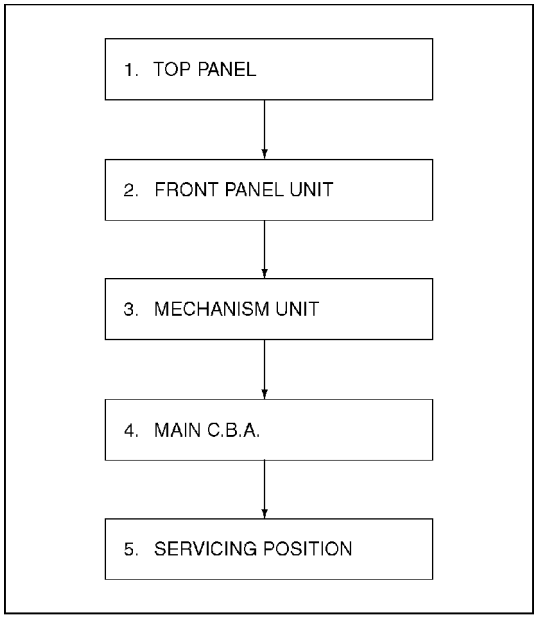
3. ADJUSTMENT PROCEDURES

3.1. DISASSEMBLY METHOD

3.1.1. DISASSEMBLY FLOW CHART

This flow chart indicates disassembly steps of the cabinet parts and the circuit boards in order to find the necessary items for servicing.
When reassembling, perform the steps in the reverse order.

Fig. D1

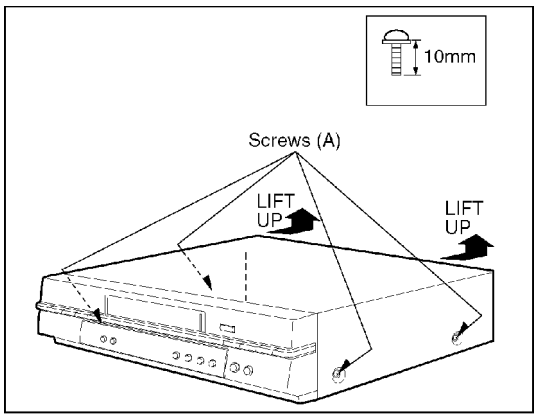


3.1.2. DETAIL OF DISASSEMBLY METHOD

1. REMOVAL OF THE TOP PANEL

Remove	**4 Screws (A)**

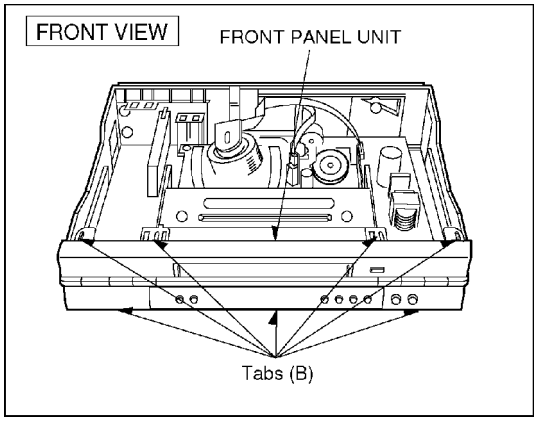
Fig.D2



2. REMOVAL OF THE FRONT PANEL UNIT

Unlock	**7 Tabs (B)**

Fig. D3



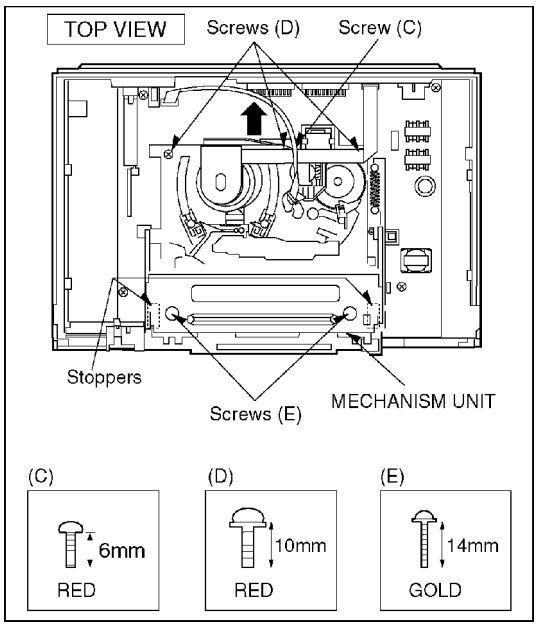
3. REMOVAL OF THE MECHANISM UNIT

Remove	**Screw (C)**
Remove	**3 Screws (D)**
Remove	**2 Screws (E)**

Note:

1. **Keep pressing 2 stoppers on Cassette Holder Plate and Press Cassette Holder Plate to the rear.**
2. **Remove the Mechanism Unit after bend the Cylinder Shield in the direction of the arrow.**

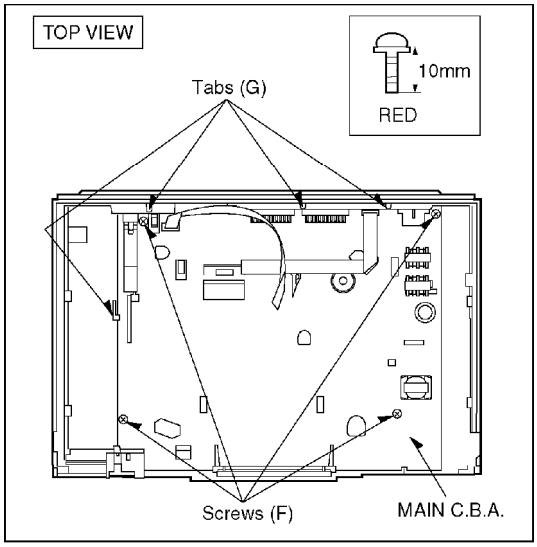
Fig. D4



4. REMOVAL OF THE MAIN C.B.A.

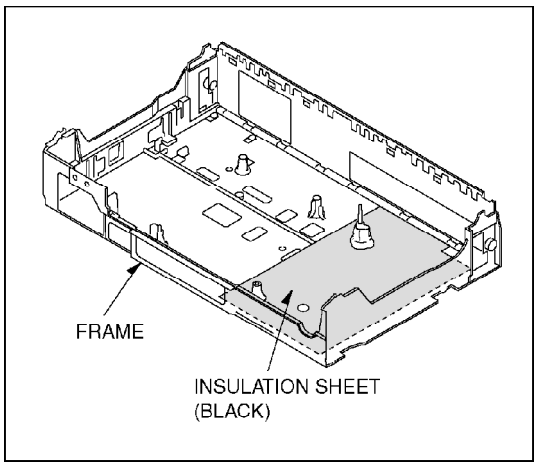
Remove	**4 Screws (F)**
Unlock	**4 Tabs (G)**

Fig. D5



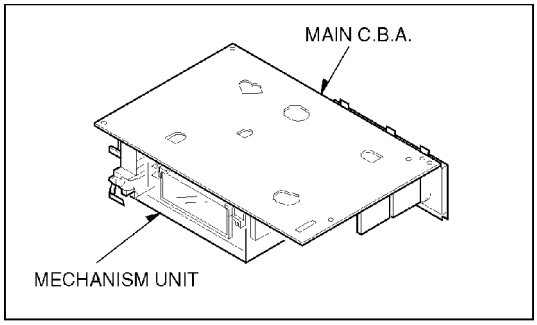
NOTE:
Before mounting the MAIN C.B.A. onto the frame, be sure to confirm that the insulation sheet is mounted on the frame as shown in Fig. D6 .

Fig. D6



5. SERVICING POSITION

Fig. D7



3.2. MECHANICAL ADJUSTMENT PROCEDURES

Refer to the Service Manual for Z-Mechanism Chassis. / (Order No. VRD9802005C2)

3.3. ELECTRICAL ADJUSTMENT PROCEDURES

3.3.1. TEST EQUIPMENT

The following equipments are required for Electrical Adjustments.

1. Dual-Trace Oscilloscope
   - Voltage Range: 0.005-5V/div
   - Frequency Range: DC-35MHz
   - Probes: 10:1 / 1:1
2. Frequency Counter
   - Frequency Range: 0-10MHz
   - Probes: 1:1
3. Universal Counter
4. Digital Volt Meter (D.V.M.)
5. Video Sweep Generator
6. Sinewave Generator
7. Video Pattern Generator
8. Monitor TV
9. DC Power Supply
10. VHS Blank Tape
11. VHS Alignment Tape
    - Parts No.: VFJ8125H3F(PAL)

3.3.2. VCR SETTING

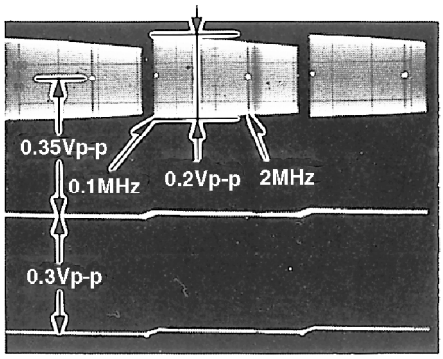
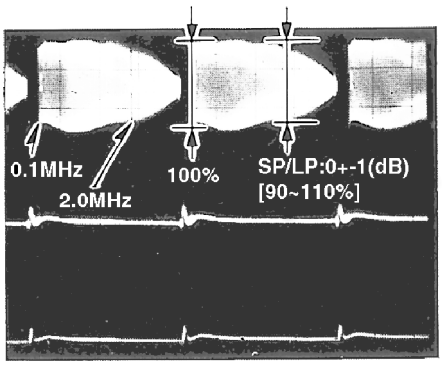
When no indication in the procedure, set each selector as follows.

1. TAPE SPEED: SP

2. CHANNEL: AV1/AV2
(Set to signal input terminal number)

3.3.3. ADJUSTMENTS

ITEM	TP	ADJ.	MODE	INPUT	TAPE	M. EQ.	SPEC.	REMARKS
PG SHIFTER ADJUSTMENT	---	---	PLAYBACK	---	ALIGNMENT TAPE (PAL)	---	---	Refer to procedure as shown in Fig.E3.
VHS FREQUENCY RESPONSE ADJUSTMENT	VIDEO OUT (TW3002)	---	SP/LP PLAYBACK (SELF-REC)	VIDEO SWEEP (See Fig. E1)	VHS BLANK TAPE	OSCILLO SCOPE/ SWEEP GENERATOR	SP: 0+-1 (dB) (90~110%) LP: 0+-1 (dB) (90~110%) (See Fig. E2)	Refer to the procedure as shown in Fig. E4.

Fig.E1	Fig.E2	
		
CONDITION: BURST SIGNAL OFF / 75 ohm TERMINATED		

3.3.4. PG SHIFTER ADJUSTMENT / (AUTOMATIC)

PROCEDURES	FIP DISPLAY
Press the FF and EJECT Keys simultaneously for 3 seconds.	
Press the FF and EJECT Keys simultaneously twice.	
Press the EJECT key for 3 seconds.	
Press the CH UP key once.	
Insert the Alignment cassette tape. (PAL:VFJ8125H3F)	
When the sequence of the automatical adjustment has been terminated, the following action has been made. ***SUCCEED: The cassette tape is ejected.** ***ERROR : The "F2"is displayed on the FIP.** **(Check the Servo/Syscon circuit and Cylinder unit.)**	
Release the Service mode by pressing the EJECT and FF keys simultaneously in 6 times until the FIP becomes normal indication.	

Fig. E3

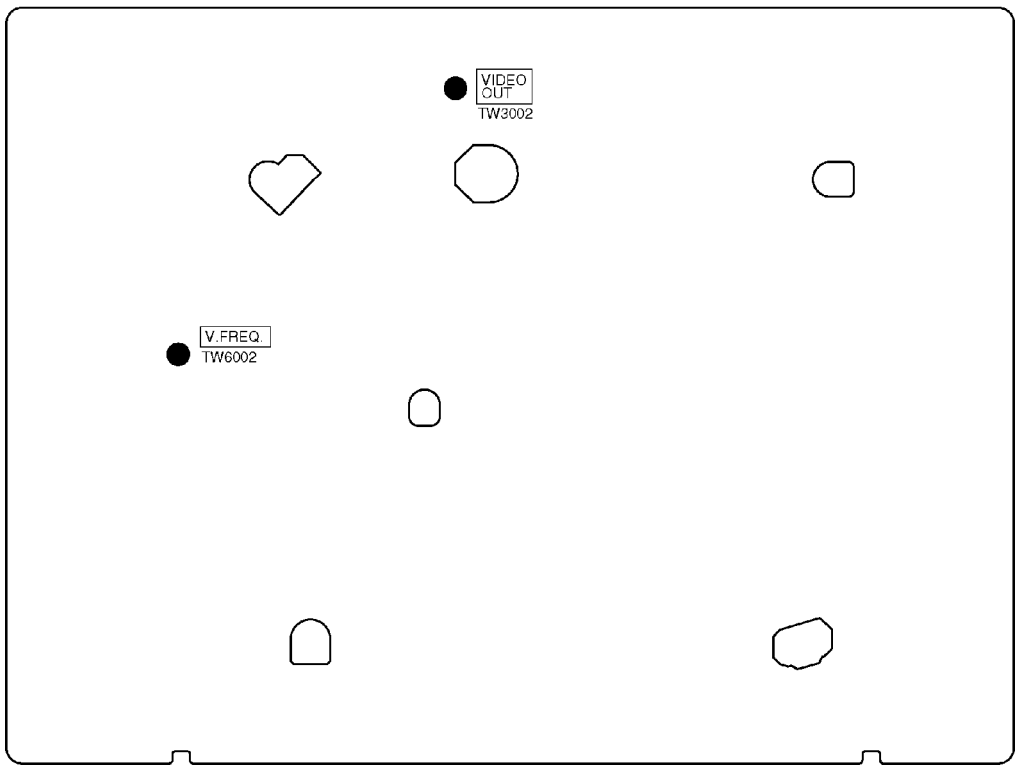
3.3.5. VHS FREQUENCY RESPONSE ADJUSTMENT

PROCEDURES	FIP DISPLAY
Insert the VHS Blank Tape. Input the Video sweep signal (See Fig. E1) to AV1 (VIDEO IN) and record it in SP and LP.	
Press the FF and EJECT Keys simultaneously for 3 seconds.	
Press the FF and EJECT Keys simultaneously twice.	
Press the EJECT key for 3 seconds.	
Press the CH UP and/or CH DOWN key until "11" is displayed on FIP.	
Insert the Self-recorded tape and playback it. (SP/LP mode)	
Connect the Oscilloscope to: *CH1....Video Out (TW3002). *CH2....V.FREQ.(TW6002)	
Press the "4" key on the remote controller. (Confirm that TW6002 becomes high(2.5V)).	
Adjust the Frequency response by pressing the "2"(increase) and/or "8"(decrease) key on the Remote Controller. (See Fig.E2)	
Store the Adjusted value by pressing the "5" key on the Remote Controller.	
Release the Service mode by pressing the EJECT and FF keys simultaneously in 6 times until the FIP becomes normal indication.	

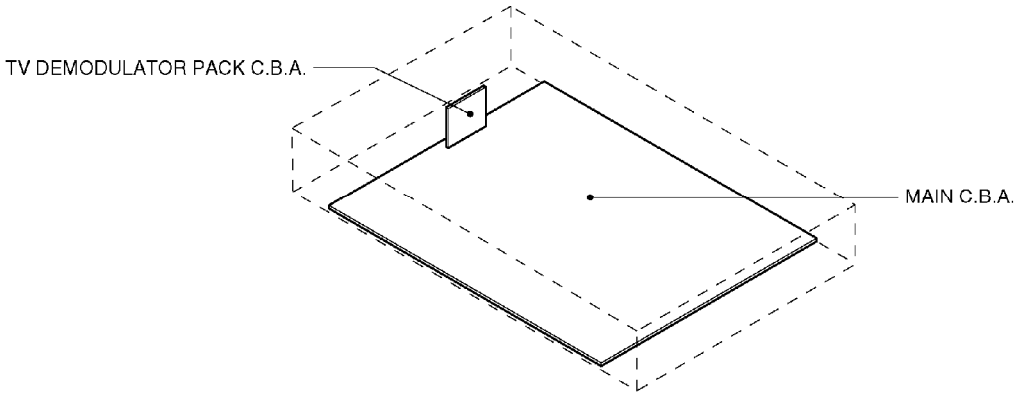
Fig. E4

3.3.6. LOCATION OF TEST POINTS & CONTROLS

MAIN C.B.A.



3.3.7. CIRCUIT BOARD LAYOUT



4. ABBREVIATIONS

5. INPUT/OUTPUT CHART

5.1. INPUT/OUTPUT CHART FOR IC6001

5.2. TRUTH TABLE (EC/EP MODEL)

5.3. TRUTH TABLE (EB/EBL MODEL)

6. WAVEFORM TABLE & VOLTAGE CHART

6.1. WAVEFORM TABLE

6.2. VOLTAGE CHART

7. BLOCK DIAGRAMS

7.1. SYSTEM CONTROL & SERVO BLOCK DIAGRAM

7.2. LUMINANCE & CHROMINANCE BLOCK DIAGRAM

7.3. AUDIO BLOCK DIAGRAM

8. SCHEMATIC DIAGRAMS

8.1. POWER TRANSFORMER SECTION IN MAIN SCHEMATIC DIAGRAM

8.2. POWER SUPPLY/ RF SECTION IN MAIN SCHEMATIC DIAGRAM

8.3. TIMER SECTION IN MAIN SCHEMATIC DIAGRAM

8.4. SYSTEM CONTROL & SERVO SECTION IN MAIN SCHEMATIC DIAGRAM

8.5. LUMINANCE & CHROMINANCE/ AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM

8.6. Hi-Fi AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM

8.7. INPUT/ OUTPUT SECTION IN MAIN SCHEMATIC DIAGRAM

8.8. DECODER SECTION IN MAIN SCHEMATIC DIAGRAM

8.9. TV DEMODULATOR PACK SCHEMATIC DIAGRAM

8.10. CYLINDER STATOR UNIT SCHEMATIC DIAGRAM

8.11. CAPSTAN UNIT SCHEMATIC DIAGRAM

9. CIRCUIT BOARD ASSEMBLIES

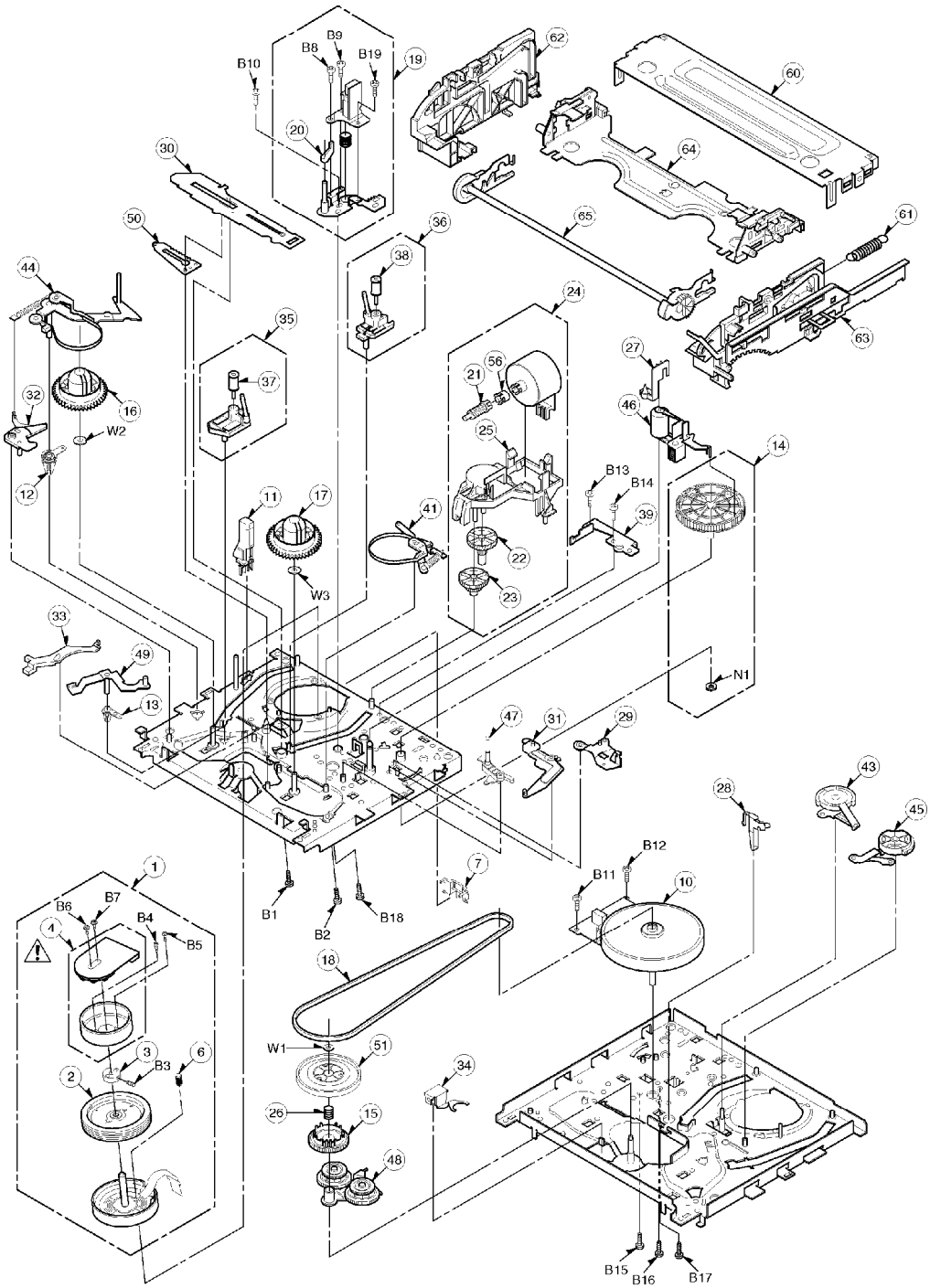
9.1. TV DEMODULATOR PACK C.B.A.

9.2. CYLINDER STATOR UNIT

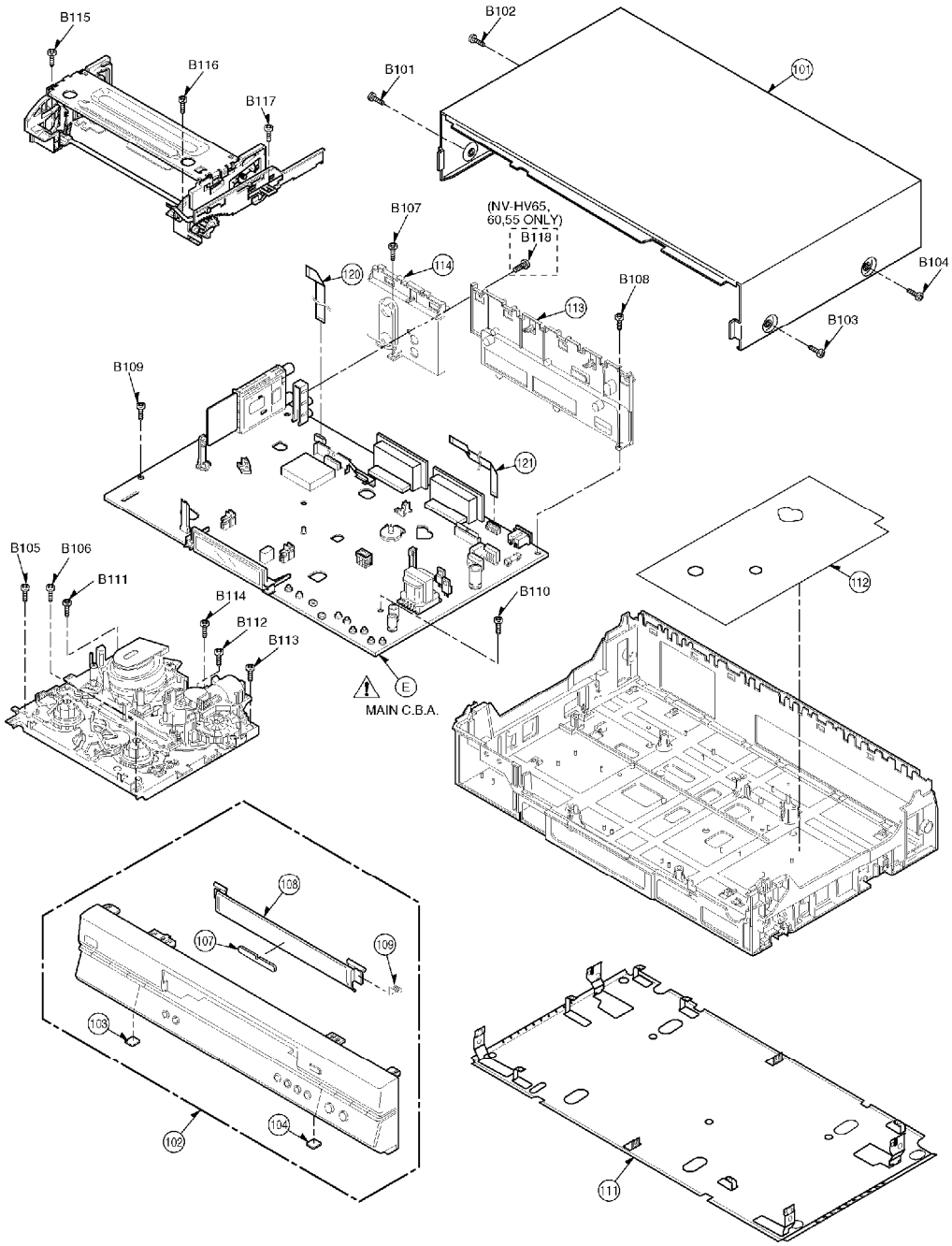
9.3. MAIN C.B.A.

10. EXPLODED VIEWS

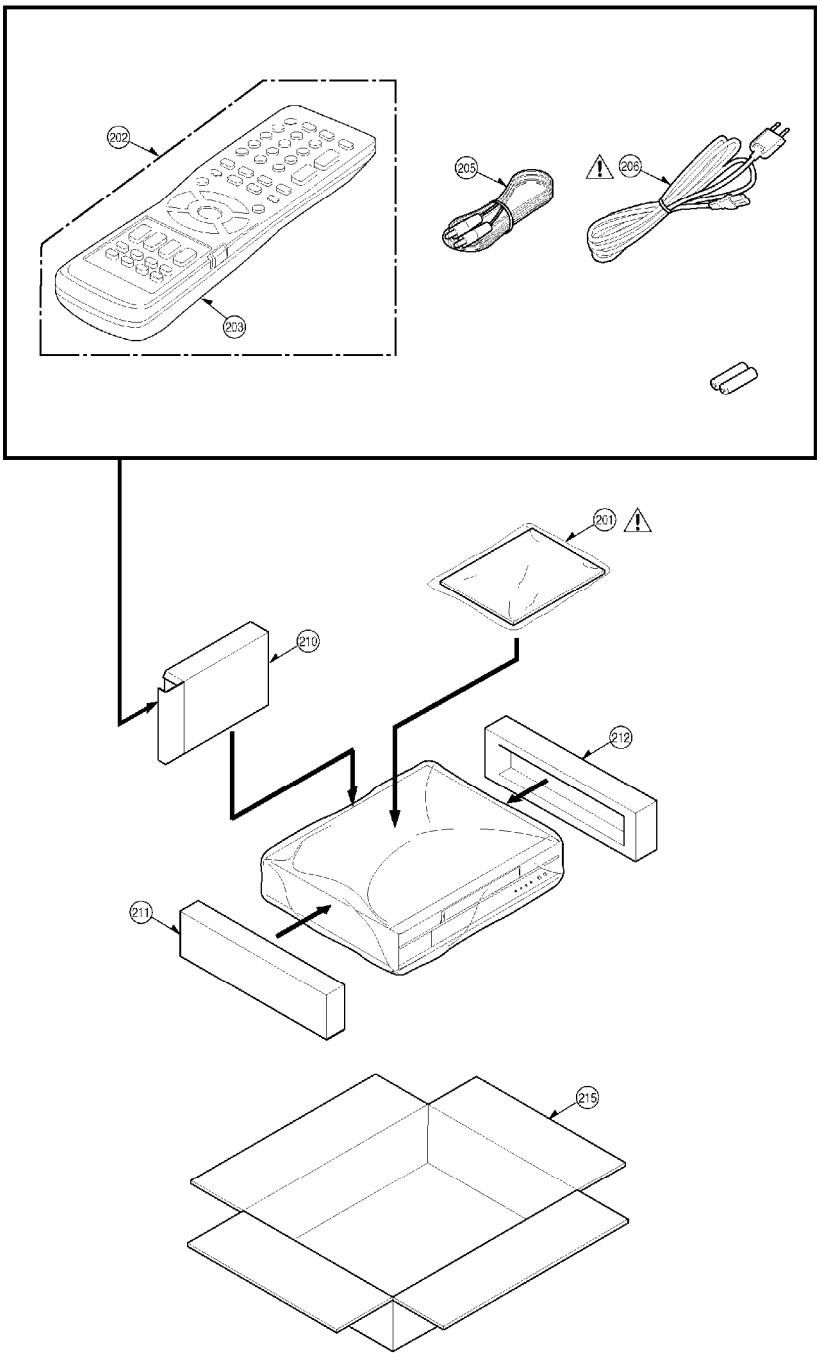
10.1. CHASSIS PARTS SECTION



10.2. CASING PARTS SECTION



10.3. PACKING PARTS SECTION



11. REPLACEMENT PARTS LIST

11.1. CHASSIS PARTS SECTION PARTS LIST

- All parts except parts mentioned [AVC-SPC] in the Remarks column are supplied from MAVD.
Parts mentioned [AVC-SPC] are supplied from PAVC-CSG (AVC-SPC).

Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Remarks
1	VEG1598	CYLINDER UNIT	
2	VXP2170	UPPER CYLINDER UNIT	
3	VDB1256	CYLINDER RETAINER	
4	VEM0715	CYLINDER MOTOR UNIT	⚠
6	VXS0135	EARTH BRUSH UNIT	
7	VMD3795	FLAT CABLE HOLDER	
10	VEK9069	CAPSTAN UNIT	
11	L1AZ00000004	FE HEAD	
12	VDB1431	TENSION ARM BOSS	
13	VDB1460	SUPPLY BRAKE ARM BOSS	
14	VDG1220KIT	MAIN CAM GEAR	
15	VDG1221	CONVERSION GEAR	
16	VDR0350	REEL TABLE	
17	VDR0350	REEL TABLE	
18	VDV0382	CAPSTAN BELT	
19	VED0412	A/C HEAD UNIT	
20	VMX2656	P4 CAP	
21	VDG1217	WORM GEAR	
22	VDG1218	WORM WHEEL GEAR	
23	VDG1219	CENTRE GEAR	
24	VEM0604	LOADING MOTOR UNIT	
25	VMD2619	MOTOR BRACKET	
26	VMB3045	CONVERSION GEAR SPRING	
27	VMD2620	OPENER PIECE	
28	VMD2738	LED PRISM	
29	VML3165	DRIVE RACK ARM	
30	VML3166	MAIN LEVER	
31	VML3167	DRIVE MAIN LEVER ARM	
32	VML3172	SUPPLY SPRING ARM	
33	VML3176	CONVERSION LEVER A	
34	VML3177	CONVERSION LEVER B	
35	VXA6040	INCLINED BASE (S) UNIT	
36	VXA5854	INCLINED BASE (T) UNIT	
37	VXP1891	ROLLER POST	
38	VXP1891	ROLLER POST	
39	VMA9672	SUPPORT ANGLE	
41	VXL2667	TAKE UP BRAKE ARM UNIT	
43	VXL2670	TAKE UP LOADING ARM UNIT	
44	VXL2798	TENSION ARM UNIT	
45	VXL2672	SUPPLY LOADING ARM UNIT	
46	VXL2785	PINCH ARM UNIT	
47	VXL2996	P5 ARM UNIT	
48	VXL2792	IDLER ARM UNIT	
49	VXL2733	SUPPLY BRAKE ARM UNIT	
50	VML3271	LOADING RACK B	
51	VXP2035	CENTRE CLUTCH UNIT	
56	VDP1660	MOTOR COUPLING	
60	VMA9516	TOP PLATE	
61	VMB3047	CONNECTION SPRING	
62	VMD3379	SIDE PLATE (L)	

Ref. No.	Part No.	Part Name & Description	Remarks
63	VXA6540	SIDE PLATE (R) UNIT	
64	VXA5746	CASSETTE HOLDER UNIT	
65	VXP1730	MAIN SHAFT UNIT	
B1	VHD1117	SCREW	
B2	VHD1117	SCREW	
B3	VHD0842	SCREW	
B4	VHD0843	SCREW	
B5	VHD0843	SCREW	
B6	VHD0844	SCREW	
B7	VHD0844	SCREW	
B8	VHD1066	SCREW	
B9	VHD1066	SCREW	
B10	VHD1044	SCREW	
B11	VHD1060	SCREW	
B12	VHD1071	SCREW	
B13	XTS26+6F	SCREW	
B14	XTN26+6F	SCREW	
B15	XTN26+7J	SCREW	
B16	XTN26+7J	SCREW	
B17	XTN26+7J	SCREW	
B18	VHD1095	SCREW	
B19	VHD1185	SCREW	
N1	VHN0311	PUSH NUT	
W1	VMX2208	WASHER	
W2	VMX3022	WASHER	
W3	VMX3022	WASHER	

11.2. CASING PARTS SECTION PARTS LIST

- All parts except parts mentioned [AVC-SPC] in the Remarks column are supplied from MAVD.
Parts mentioned [AVC-SPC] are supplied from PAVC-CSG (AVC-SPC).

Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Remarks
101	VGM1993	TOP PANEL black	NV-HV60EB-K/EC-K/EP-K
101	VGM1990	TOP PANEL silver	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
102	VYP8758	FRONT PANEL UNIT	NV-HV50EC-S
102	VYP8756	FRONT PANEL UNIT	NV-HV55EC-S
102	VYP8748	FRONT PANEL UNIT	NV-HV60EB-K
102	VYP8747	FRONT PANEL UNIT	NV-HV60EB-S/EBL-S
102	VYP8746	FRONT PANEL UNIT	NV-HV60EC-K
102	VYP8745	FRONT PANEL UNIT	NV-HV60EC-S
102	VYP8751	FRONT PANEL UNIT	NV-HV60EP-K
102	VYP8750	FRONT PANEL UNIT	NV-HV60EP-S
102	VYP8754	FRONT PANEL UNIT	NV-HV65EC-S
103	RKA0072-K	LEG	
104	RKA0072-K	LEG	
107	VGB0554	SUPER DRIVE BADGE	
108	VKF3686	BLINDER PANEL	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
108	VKF3704	BLINDER PANEL	NV-HV60EB-K/EC-K/EP-K
109	VMB2521	BLINDER SPRING	
111	VKU0575	BOTTOM PLATE(VCR)	
112	VMZ3099-W	V0 SHEET	⚠
113	VJH1175	JACK BOARD	
114	VJH1174	ANT BOARD	NV-HV50
114	VJH1234	ANT BOARD HV60	NV-HV55/60/65
120	VWJ1651	FFC (P4002-A/C HEAD)	
121	VWJ1282	FFC (P2502-CYL)	⚠
B101	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B101	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B102	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B102	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B103	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B103	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B104	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B104	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B105	VHD0168	SCREW FOR MECHA.CHAS	
B106	VHD0168	SCREW FOR MECHA.CHAS	
B107	VHD1092	SCREW	
B108	VHD1092	SCREW	
B109	VHD1092	SCREW	
B110	VHD1092	SCREW	
B111	VHD1092	SCREW	
B112	VHD1092	SCREW	
B113	VHD1092	SCREW	
B114	XTV26+8FR-NC	TAPPING SCREW	
B115	XTV26+8FR-NC	TAPPING SCREW	
B116	XTV26+8FR-NC	TAPPING SCREW	
B117	XTV26+8FR-NC	TAPPING SCREW	
B118	XTV3+8GFZ	TAPPING SCREW	NV-HV55/60/65

11.3. PACKING PARTS SECTION PARTS LIST

- All parts except parts mentioned [AVC-SPC] in the Remarks column are supplied from MAVD.
Parts mentioned [AVC-SPC] are supplied from PAVC-CSG (AVC-SPC).

Note: 1. *Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Remarks
201	RQTD0038-A	OPERATING INSTRUCTIONS (ENGLISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0037-D	OPERATING INSTRUCTIONS (GERMAN)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0042-C	OPERATING INSTRUCTIONS (FRENCH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0041-H	OPERATING INSTRUCTIONS (DUTCH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0078-B	OPERATING INSTRUCTIONS (ENGLISH)	⚠ NV-HV60EB-S/60EB-K/60EBL-S
201	RQTD0050-T	OPERATING INSTRUCTIONS (HUNGARIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0051-R	OPERATING INSTRUCTIONS (RUSSIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0052-S	OPERATING INSTRUCTIONS (CZECHOSLOVAKIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0053-Q	OPERATING INSTRUCTIONS (POLISH)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0045-K	OPERATING INSTRUCTIONS (FINISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0046-J	OPERATING INSTRUCTIONS (DANISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0047-U	OPERATING INSTRUCTIONS (PORTUGUESE)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0048-Z	OPERATING INSTRUCTIONS (SWEDISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0049-M	OPERATING INSTRUCTIONS (SPANISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0080-A	OPERATING INSTRUCTIONS (ENGLISH)	⚠ NV-HV60EP-S/60EP-K
202	N2QAHB000031	REMOTE CONTROLLER	NV-HV50EC-S
202	N2QAKB000043	REMOTE CONTROLLER	NV-HV55EC-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
202	N2QAKB000044	REMOTE CONTROLLER	NV-HV60EB-S/60EB-K/60EBL-S
203	R0185-720010	BATTERY COVER	NV-HV50EC-S
203	R0186-720010	BATTERY COVER	NV-HV55EC-S/60EB-S/60EB-K/60EBL-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
205	K2KF2BA00001	DIN RF CABLE	
206	RJA0043-1C	AC CABLE	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
206	RJA0044-3C	AC CABLE	⚠ NV-HV60EB-S/60EB-K/60EBL-S
210	VPK2246	ACCESSORY CASE	
211	VPN5491	CUSHION L (VHS)	

Ref. No.	Part No.	Part Name & Description	Remarks
212	VPN5492	CUSHION R (VHS)	
215	VPG0T30	PACK.CASE HV50 S	NV-HV50EC-S
215	VPG0T29	PACK.CASE HV55 S	NV-HV55EC-S
215	VPG0T26	PACK.CASE HV60 K	NV-HV60EB-K/EC-K/EP-K
215	VPG0T25	PACK.CASE HV60 S	NV-HV60EBL-S/EB-S/EC-S/EP-S
215	VPG0T27	PACK.CASE HV65 S	NV-HV65EC-S
		SERVICE FIXTURES & TOOLS	
	VFJ8125H3F	VHS ALIGNMENT TAPE (PAL)	[AVC-SPC]
	VFK0335	RETAINING RING REMOVER (3mm/ 4mm)	[AVC-SPC]
	VFK0329	POST ADJUSTMENT SCREWDRIVER	[AVC-SPC]
	VFK0326	HEX WRENCH SET	[AVC-SPC]
	VFK0132	BACK TENSION METER	[AVC-SPC]
	VFK27	HEAD CLEANING STICK	[AVC-SPC]
	VFK1024	MOLYTONE GREASE	[AVC-SPC]
	VFK0330	FINE ADJUSTMENT GEAR DRIVER	[AVC-SPC]
	VFK1301	SILICONE GREASE	[AVC-SPC]
	VFK1298	FLOIL GREASE	[AVC-SPC]

11.4. ELECTRICAL PARTS LIST

- All parts except parts mentioned [AVC-SPC] in the Remarks column are supplied from MAVD.
Parts mentioned [AVC-SPC] are supplied from PAVC-CSG (AVC-SPC).

Note: 1. Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE: Components identified with the mark △ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS, K=1,000 OHMS. All capacitors are in MICROFARADS (uf), P=uuF.
4. The P.C. Board units marked width "■" show below the main assembled parts.
5. The marking (RTL) indicaters the retention time is limited for this item.
After the discontinuation of this assembly in production, it will no longer be available.
6. " ^1 ", " ^2 ", " ^3 ", " ^4 ", " ^5 " in the Remarks column shows the models as follows.
" ^1 ": NV-HV65EC, NV-HV60EC, NV-HV55EC
" ^2 ": NV-HV60EB
" ^3 ": NV-HV60EBL
" ^4 ": NV-HV60EP
" ^5 ": NV-HV50EC

Ref. No.	Part No.	Part Name & Description	Remarks
■	VEP06F09G	MAIN C.B.A.	(RTL) *1
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23S-SK
■	VEP06F09H	MAIN C.B.A.	(RTL) *2
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23T-SK
■	VEP06F09J	MAIN C.B.A.	(RTL) *3
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23U-SK
■	VEP06F09L	MAIN C.B.A.	(RTL) *4
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23U-SK
■	VEP06F09N	MAIN C.B.A.	(RTL) *5
			THE FOLLOWING C.B.A. IS INCLUDED IN MAIN C.B.A.
			VEP07A23S-SK
■	VEP07A23S-SK	TV DEMODULATOR PACK C.B.A.	(RTL) *1, *5
			INCLUDED IN MAIN C.B.A.(VEP06F09G/N).
■	VEP07A23T-SK	TV DEMODULATOR PACK C.B.A.	(RTL) *2
			INCLUDED IN MAIN C.B.A.(VEP06F09H).
■	VEP07A23U-SK	TV DEMODULATOR PACK C.B.A.	(RTL) *3
			INCLUDED IN MAIN C.B.A.(VEP06F09J).
■	VEP07A23U-SK	TV DEMODULATOR PACK C.B.A.	(RTL) *4
			INCLUDED IN MAIN C.B.A.(VEP06F09L).
■	----------	CYLINDER STATOR C.B.A.	INCLUDED IN CYLINDER STATOR UNIT (VEM0715).
■	----------	CAPSTAN DRIVE C.B.A.	INCLUDED IN CAPSTAN UNIT (VEK9069).
■	VEP06F09G	MAIN C.B.A.	(RTL) *1
■	VEP06F09H	MAIN C.B.A.	(RTL) *2
■	VEP06F09J	MAIN C.B.A.	(RTL) *3
■	VEP06F09L	MAIN C.B.A.	(RTL) *4

Ref. No.	Part No.	Part Name & Description	Remarks
■	VEP06F09N	MAIN C.B.A.	(RTL) *5
C0701	ECJ2VF1C105Z	CHIP CAPACITOR	ECUV1C105ZFN
C0702	F1H1H102A009	CHIP CAPACITOR	
C0703	F1J1A1050024	CHIP CAPACITOR	
C0704	ECJ2VB1H333K	CHIP CAPACITOR	
C0707	ECEA1HKA2R2B	ALU ELEC CAPACITOR	
C0708	ECEA1HKAR47B	ALU ELEC CAPACITOR	
C0710	F1H1H103A220	CHIP CAPACITOR	
C0711	ECEA1CKA220B	ALU ELEC CAPACITOR	
C0712	F1H1C104A008	CHIP CAPACITOR	
C0713	ECEA0JKA331Q	ALU ELEC CAPACITOR	
C0714	ECJ2VF1C105Z	CHIP CAPACITOR	ECUV1C105ZFN
C0715	ECJ1VC1H030C	CHIP CAPACITOR	*1, *3, *4, *5 ECUV1H030CCV
C0715	F1H1H120A230	CHIP CAPACITOR	*2
C0717	ECUV1H330GUV	CHIP CAPACITOR	
C0719	F1H1E104A030	CHIP CAPACITOR	ECUV1E104ZFV
C0721	ECJ1VC1H121J	CHIP CAPACITOR	*1, *5 ECUV1H121JCV
C0721	F1H1H820A230	CHIP CAPACITOR	*2
C0721	ECJ1VC1H560J	CHIP CAPACITOR	*3, *4 ECUV1H560JCV
C0724	ECJ1VB1H221K	CHIP CAPACITOR	*1, *3, *4, *5 ECUV1H221KBV
C0724	ECJ1VB1H331K	CHIP CAPACITOR	*2
C1002	EEUEB1E470SB	ALU ELEC CAPACITOR	
C1003	F1H1C104A071	CHIP CAPACITOR	
C1004	EEUEB1E470SB	ALU ELEC CAPACITOR	
C1008	F1H1C104A071	CHIP CAPACITOR	
C1009	F1H1C104A071	CHIP CAPACITOR	
C1011	EEUEB1E470SB	ALU ELEC CAPACITOR	
C1016	ECA1CHJ101B	ALU ELEC CAPACITOR	
C1018	F1H1C104A071	CHIP CAPACITOR	
C1019	F1H1C104A071	CHIP CAPACITOR	
C1025	ECUY1H104KBN	CHIP CAPACITOR	
C1026	ECUY1H104KBN	CHIP CAPACITOR	
C1120	VCF2AAF683M	EMI CAPACITOR	ECQU2A683MVA
C1121	F1BAF1020020	CAPACITOR	
C1123	F1BAF1020020	CAPACITOR	
C1141	EEUEB2G330E	ALU ELEC CAPACITOR	
C1151	ECQB1H473JF3	PLAST FILM CAPACITOR	
C1152	ECQB1H103JF3	PLAST FILM CAPACITOR	
C1153	ECQV1H104JL3	PLAST FILM CAPACITOR	
C1154	ECQB1H223JF3	PLAST FILM CAPACITOR	
C1155	F1A3A271A028	CAPACITOR	
C1200	ECQV1H104JL3	PLAST FILM CAPACITOR	
C1210	F1B3A332A004	CAPACITOR	
C1230	F2A1H2200032	ALU ELEC CAPACITOR	
C1250	F2A1E6810012	ALU ELEC CAPACITOR	
C1251	F2A1E101A122	ALU ELEC CAPACITOR	ECA1EM101B
C1260	F2A1A1020056	ALU ELEC CAPACITOR	
C1261	ECA1AHJ331B	ALU ELEC CAPACITOR	
C1270	F2A1H2200032	ALU ELEC CAPACITOR	
C1280	F2A1A1010072	ALU ELEC CAPACITOR	
C2501	ECJ1VB1C563K	CHIP CAPACITOR	ECUV1C563KBV
C2502	F1H1C104A071	CHIP CAPACITOR	
C2503	F1H1C104A008	CHIP CAPACITOR	

Ref. No.	Part No.	Part Name & Description	Remarks
C2505	ECJ1VB1C563K	CHIP CAPACITOR	ECUV1C563KBV
C2506	ECJ1VB1C563K	CHIP CAPACITOR	ECUV1C563KBV
C2507	ECJ1VB1C563K	CHIP CAPACITOR	ECUV1C563KBV
C2508	F1H1C104A071	CHIP CAPACITOR	
C2509	ECJ1VF1C474Z	CHIP CAPACITOR	ECUV1C474ZFV
C2510	F1H1H330A230	CHIP CAPACITOR	
C2511	ECEA0JKN220B	ALU ELEC CAPACITOR	
C2512	ECEA1EKA4R7B	ALU ELEC CAPACITOR	
C2513	ECJ1VB1H392K	CHIP CAPACITOR	ECUV1H392KBV
C2514	F1H1C104A008	CHIP CAPACITOR	
C2515	ECEA1VKN4R7B	ALU ELEC CAPACITOR	
C2516	ECEA1VKN4R7B	ALU ELEC CAPACITOR	
C2517	ECEA0JKA470B	ALU ELEC CAPACITOR	
C2518	ECUV1H473ZFV	CHIP CAPACITOR	ECJ1VF1H473Z
C2519	ECEA1EKA470B	ALU ELEC CAPACITOR	
C2520	ECJ1VB1C683K	CHIP CAPACITOR	
C2521	ECJ1VB1A154K	CHIP CAPACITOR	
C2522	ECJ1VB1A154K	CHIP CAPACITOR	
C2523	ECJ1VB1A154K	CHIP CAPACITOR	
C2524	ECEA1VKN4R7B	ALU ELEC CAPACITOR	
C3001	ECJ1VC1H151J	CHIP CAPACITOR	ECUV1H151JCV
C3002	F1H0J105A002	CHIP CAPACITOR	⚠
C3003	F1H1C104A071	CHIP CAPACITOR	⚠
C3005	F1H1H270A230	CHIP CAPACITOR	
C3006	F1H1C104A071	CHIP CAPACITOR	
C3007	ECJ1VF1A105Z	CHIP CAPACITOR	ECUV1A105ZFV
C3008	ECEA1HKA4R7B	ALU ELEC CAPACITOR	
C3009	ECJ1VF1A105Z	CHIP CAPACITOR	ECUV1A105ZFV
C3010	ECJ1VF1A105Z	CHIP CAPACITOR	ECUV1A105ZFV
C3011	F1H1H103A220	CHIP CAPACITOR	
C3012	ECEA0JKA470B	ALU ELEC CAPACITOR	
C3014	F1H1C104A071	CHIP CAPACITOR	
C3015	F1H0J105A002	CHIP CAPACITOR	
C3017	F1H1C104A071	CHIP CAPACITOR	
C3019	F1H1C104A071	CHIP CAPACITOR	
C3020	ECEA1HKA3R3B	ALU ELEC CAPACITOR	
C3021	ECEA1CKA100B	ALU ELEC CAPACITOR	
C3023	F1H1H103A748	CHIP CAPACITOR	
C3024	ECJ1VC1H331J	CHIP CAPACITOR	ECUV1H331JCV
C3025	F1H1H103A220	CHIP CAPACITOR	
C3026	ECEA0JKA470B	ALU ELEC CAPACITOR	
C3027	ECEA1HKA010B	ALU ELEC CAPACITOR	
C3028	ECEA1HKA4R7B	ALU ELEC CAPACITOR	
C3029	ECEA1HKAR47B	ALU ELEC CAPACITOR	
C3030	F1H1E223A029	CHIP CAPACITOR	
C3031	F1H1C333A059	CHIP CAPACITOR	
C3032	ECEA1HKA3R3B	ALU ELEC CAPACITOR	
C3033	F1H1C104A071	CHIP CAPACITOR	
C3034	ECEA1HKA2R2B	ALU ELEC CAPACITOR	
C3035	F1H1E223A029	CHIP CAPACITOR	
C3036	ECEA0JKA470B	ALU ELEC CAPACITOR	
C3037	F1H1H103A220	CHIP CAPACITOR	
C3038	ECJ1VC1H030C	CHIP CAPACITOR	ECUV1H030CCV

Ref. No.	Part No.	Part Name & Description	Remarks
C3039	ECEA1HKA010B	ALU ELEC CAPACITOR	
C3040	F1H1H103A220	CHIP CAPACITOR	
C3041	F1H1H103A220	CHIP CAPACITOR	
C3042	ECJ1VF1A105Z	CHIP CAPACITOR	ECUV1A105ZFV
C3053	F1H1H103A220	CHIP CAPACITOR	
C3054	F1H1H470A230	CHIP CAPACITOR	
C3058	F1H1C104A071	CHIP CAPACITOR	
C3070	F1H1C104A071	CHIP CAPACITOR	
C3071	ECJ2VF1H104Z	CHIP CAPACITOR	
C4001	ECEA0JKA101B	ALU ELEC CAPACITOR	
C4003	F1H1H472A219	CHIP CAPACITOR	
C4004	ECJ1VB1H122K	CHIP CAPACITOR	
C4005	ECEA0JKA220B	ALU ELEC CAPACITOR	
C4006	ECEA1EKA4R7B	ALU ELEC CAPACITOR	
C4008	ECEA1EKA3R3B	ALU ELEC CAPACITOR	
C4009	ECEA0JKA220B	ALU ELEC CAPACITOR	
C4011	ECJ1VB1H822K	CHIP CAPACITOR	ECUV1H822KBV
C4012	ECEA1HKA4R7B	ALU ELEC CAPACITOR	
C4013	F1H1H103A220	CHIP CAPACITOR	
C4014	ECEA0JKA470B	ALU ELEC CAPACITOR	
C4016	F1H1C104A071	CHIP CAPACITOR	
C4017	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4018	ECEA1HKA010B	ALU ELEC CAPACITOR	
C4019	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4020	F1H1H221A736	CHIP CAPACITOR	
C4021	ECQB1H223JF3	PLAST FILM CAPACITOR	
C4022	F1H1H152A219	CHIP CAPACITOR	
C4023	ECEA1AKA470B	ALU ELEC CAPACITOR	
C4024	F1H1E223A029	CHIP CAPACITOR	
C4025	ECEA1AKA220B	ALU ELEC CAPACITOR	
C4026	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4501	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4502	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4503	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4504	ECQB1H473JF3	PLAST FILM CAPACITOR	
C4505	ECEA1AKA330B	ALU ELEC CAPACITOR	
C4506	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4507	ECEA1CKA220B	ALU ELEC CAPACITOR	
C4508	ECQB1H153JF3	PLAST FILM CAPACITOR	
C4509	F1H1C333A059	CHIP CAPACITOR	
C4511	F1H1H103A748	CHIP CAPACITOR	
C4514	F1H1H103A748	CHIP CAPACITOR	
C4515	ECEA0JKA101B	ALU ELEC CAPACITOR	
C4516	F1H1C104A008	CHIP CAPACITOR	
C4517	F1H1C104A071	CHIP CAPACITOR	
C4519	F1H1A224A028	CHIP CAPACITOR	
C4520	ECQB1H153JF3	PLAST FILM CAPACITOR	
C4521	ECEA0JKA220B	ALU ELEC CAPACITOR	
C4522	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4523	ECEA1AKA330B	ALU ELEC CAPACITOR	
C4524	ECQB1H473JF3	PLAST FILM CAPACITOR	
C4525	ECEA0JKA101B	ALU ELEC CAPACITOR	
C4526	F1H1C104A008	CHIP CAPACITOR	
C4529	ECEA1CKA100B	ALU ELEC CAPACITOR	

Ref. No.	Part No.	Part Name & Description	Remarks
C4530	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4531	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4532	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4533	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4534	ECEA1CKA470B	ALU ELEC CAPACITOR	
C4535	ECEA1CKA100B	ALU ELEC CAPACITOR	
C4536	ECEA1CKA220B	ALU ELEC CAPACITOR	
C4538	F1H1C104A071	CHIP CAPACITOR	
C4539	F1H1C104A008	CHIP CAPACITOR	
C4540	F1H1C104A071	CHIP CAPACITOR	
C4541	F1H1C104A071	CHIP CAPACITOR	
C4544	F1H1H101A736	CHIP CAPACITOR	
C4545	F1H1H101A736	CHIP CAPACITOR	
C4904	F1H1H470A230	CHIP CAPACITOR	
C4905	F1H1H470A230	CHIP CAPACITOR	
C4906	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4907	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4908	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4909	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4910	F1H1C104A071	CHIP CAPACITOR	
C4911	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4912	F1H1H470A230	CHIP CAPACITOR	
C4913	F1H1H470A230	CHIP CAPACITOR	
C4914	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C4915	F1H1H101A736	CHIP CAPACITOR	
C4916	F1H1H101A736	CHIP CAPACITOR	
C4917	F1H1C104A071	CHIP CAPACITOR	
C4918	F1H1H103A748	CHIP CAPACITOR	
C4919	F1H1C104A071	CHIP CAPACITOR	
C4920	F1H1C104A071	CHIP CAPACITOR	
C4923	ECEA0JKA331Q	ALU ELEC CAPACITOR	
C4924	F1H1C104A071	CHIP CAPACITOR	
C4925	F1H1C104A071	CHIP CAPACITOR	
C4926	F1H1H103A748	CHIP CAPACITOR	
C4927	F1H1H103A748	CHIP CAPACITOR	
C4928	F1H1C104A071	CHIP CAPACITOR	
C4929	F1H1H103A748	CHIP CAPACITOR	
C4930	F1H1C104A071	CHIP CAPACITOR	
C4931	F1H1C104A071	CHIP CAPACITOR	
C4932	F1H1C104A071	CHIP CAPACITOR	
C4933	F1H1H103A748	CHIP CAPACITOR	
C4934	F1H1C104A071	CHIP CAPACITOR	
C4935	F1H1H103A220	CHIP CAPACITOR	
C4936	F1H1C104A071	CHIP CAPACITOR	
C4943	F1H1C104A071	CHIP CAPACITOR	
C4952	ECJ1VC1H471J	CHIP CAPACITOR	*1, *2, *3, *4 ECUV1H471JCV
C4953	F1H1H470A230	CHIP CAPACITOR	*1, *2, *3, *4
C4954	ECJ1VC1H471J	CHIP CAPACITOR	*1, *2, *3, *4 ECUV1H471JCV
C4955	F1H1H470A230	CHIP CAPACITOR	*1, *2, *3, *4
C4957	ECEA0JKA331Q	ALU ELEC CAPACITOR	
C4958	F1H1C104A008	CHIP CAPACITOR	
C5001	F1H1H103A748	CHIP CAPACITOR	
C5002	F1H1H103A748	CHIP CAPACITOR	
C5003	F1H1H103A748	CHIP CAPACITOR	

Ref. No.	Part No.	Part Name & Description	Remarks
C5004	F1H1H103A748	CHIP CAPACITOR	
C5005	F1H1C104A071	CHIP CAPACITOR	
C5006	ECEA0JKA470B	ALU ELEC CAPACITOR	
C5007	F1H1C104A008	CHIP CAPACITOR	
C6001	ECEA0JKA470B	ALU ELEC CAPACITOR	
C6003	ECJ1VC1H471J	CHIP CAPACITOR	ECUV1H471JCV
C6004	F1H1H103A220	CHIP CAPACITOR	
C6005	F1H1H103A220	CHIP CAPACITOR	
C6006	F1H1H330A230	CHIP CAPACITOR	*4
C6009	F1H1H180A230	CHIP CAPACITOR	
C6010	F1H1H180A230	CHIP CAPACITOR	
C6011	F1H1H180A230	CHIP CAPACITOR	
C6012	F1H1H150A230	CHIP CAPACITOR	
C6015	ECEA1CKA100B	ALU ELEC CAPACITOR	
C6016	F1H1H103A220	CHIP CAPACITOR	
C6017	ECJ1VC1H681J	CHIP CAPACITOR	ECUV1H681JCV
C6022	F1H1H221A736	CHIP CAPACITOR	
C6023	ECJ1VF1A105Z	CHIP CAPACITOR	ECUV1A105ZFV
C6024	ECEA0JKA221B	ALU ELEC CAPACITOR	
C6025	F1H1C104A008	CHIP CAPACITOR	
C6027	F1H1C333A059	CHIP CAPACITOR	*1, *2, *3, *4
C6028	F1H1H222A219	CHIP CAPACITOR	*1, *2, *3, *4
C6029	ECJ1VF1C474Z	CHIP CAPACITOR	*1, *2, *3, *4 ECUV1C474ZFV
C6030	ECJ1VC1H151J	CHIP CAPACITOR	*1, *2, *3, *4 ECUV1H151JCV
C6031	F1H1C104A008	CHIP CAPACITOR	*1, *2, *3, *4
C6032	ECEA0JKA470B	ALU ELEC CAPACITOR	*1, *2, *3, *4
C6035	F1H0J105A002	CHIP CAPACITOR	
C6036	ECJ1VC1H561J	CHIP CAPACITOR	
C6038	ECJ1VC1H220J	CHIP CAPACITOR	ECUV1H220JCV
C6039	ECJ1VC1H220J	CHIP CAPACITOR	ECUV1H220JCV
C6040	ECJ1VF1H104Z	CHIP CAPACITOR	
C6041	ECJ1VF1H104Z	CHIP CAPACITOR	
C6042	ECJ1VF1H104Z	CHIP CAPACITOR	
C7501	F1H1H103A220	CHIP CAPACITOR	
C7502	ECEA1HKA100B	ALU ELEC CAPACITOR	
C7503	F1H1H120A230	CHIP CAPACITOR	
C7504	ECEA0JKA101B	ALU ELEC CAPACITOR	
C7507	F4D55473A005	ALU ELEC CAPACITOR	VCE0073-T
C7508	ECEA0JKA221B	ALU ELEC CAPACITOR	
C7509	ECUV1H682KBV	CHIP CAPACITOR	ECJ1VB1H682K
C7510	F1H1H103A220	CHIP CAPACITOR	
C7511	F1H1C104A008	CHIP CAPACITOR	
C7512	F1H1C104A008	CHIP CAPACITOR	
C7603	ECEA0JKA101B	ALU ELEC CAPACITOR	
C7604	ECEA0JKA101B	ALU ELEC CAPACITOR	
C7605	F1H1H103A220	CHIP CAPACITOR	
C7607	ECEA1HKA010B	ALU ELEC CAPACITOR	
C7609	F1H1H330A230	CHIP CAPACITOR	
C7610	F1H1H330A230	CHIP CAPACITOR	
C7611	F1H1H330A230	CHIP CAPACITOR	
C7612	ECJ1VF1H104Z	CHIP CAPACITOR	
C7614	ECEA0JKA101B	ALU ELEC CAPACITOR	
C7615	F1H1H103A220	CHIP CAPACITOR	
C7617	F1H1H103A220	CHIP CAPACITOR	*1, *3, *4, *5

Ref. No.	Part No.	Part Name & Description	Remarks
C7619	F1H1C104A071	CHIP CAPACITOR	*3, *4
C7621	ECEA1HKA2R2B	ALU ELEC CAPACITOR	
C7622	F1H1C104A071	CHIP CAPACITOR	
C7624	F1H1C104A071	CHIP CAPACITOR	
C7625	F1H1H103A220	CHIP CAPACITOR	
C7628	F1H1C104A071	CHIP CAPACITOR	
C7630	ERJ3GEYJ822V	CHIP RESISTOR	ERJ3GSJ822V
C7631	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
C7634	F1H1H101A736	CHIP CAPACITOR	
C7635	ECEA0JKA470B	ALU ELEC CAPACITOR	
C7638	F1H1C104A071	CHIP CAPACITOR	
C7641	F1H1C104A071	CHIP CAPACITOR	
C7642	F1H1C104A071	CHIP CAPACITOR	
C7645	ECEA1CKA100B	ALU ELEC CAPACITOR	
C7646	ECEA1CKA100B	ALU ELEC CAPACITOR	
C7647	ECEA0JKA101B	ALU ELEC CAPACITOR	
C7648	F1H1H103A748	CHIP CAPACITOR	
C7651	ECEA1CKA100B	ALU ELEC CAPACITOR	
C7653	ECJ1VC1H100D	CHIP CAPACITOR	
C7654	ECJ1VC1H100D	CHIP CAPACITOR	
D0702	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
D1002	MAZ4056NHF	DIODE	MA4056N-HTA
D1003	MAZ4130NLF	DIODE	MA4130N-LTA
D1005	MAZ4056NHF	DIODE	MA4056N-HTA
D1011	MAZ4051NMF	DIODE	MA4051N-MTA
D1012	B0EADD000002	DIODE	1SS119-04TJ
D1110	ERZVA5V471	SURGE ABSORBER	⚠
D1140	B0KB00000013	DIODE	
D1150	B0HAGM000006	DIODE	
D1152	MA2C18500E	DIODE (WHITE/GREEN)	MA185TA5
D1155	B0EADD000002	DIODE	1SS119-04TJ
D1157	MAZ40270LF	DIODE	
D1180	MAZ751000C	DIODE	
D1230	MA2C18500E	DIODE (WHITE/GREEN)	MA185TA5
D1250	B0JAMK000015	DIODE	
D1251	B0JAMK000015	DIODE	
D1263	B0JAME000033	DIODE (AK04V2)	
D1270	MA2C18500E	DIODE (WHITE/GREEN)	MA185TA5
D1280	B0JAME000025	DIODE (AK04V2)	11EQS04TA1
D1501	B3EA00000040	DIODE	SIR505STA47
D2501	B0EADD000002	DIODE	1SS119-04TJ
D2502	B0EADD000002	DIODE	1SS119-04TJ
D4502	B0EADD000002	DIODE	1SS119-04TJ
D4901	MAZ4075NMF	DIODE	MA4075N-MTA
D4902	MAZ4075NMF	DIODE	MA4075N-MTA
D4903	B0EADD000002	DIODE	1SS119-04TJ
D6004	B0ACCK000005	DIODE	1SS355TE-17
D7501	MAZ4240NMF	DIODE	
D7503	B0JACE000001	DIODE	RB441PT-77
D7601	MAZ43000MF	DIODE	MA4300-MTA
DP7501	A2BA00000212	DISPLAY (VCR)	

Ref. No.	Part No.	Part Name & Description	Remarks
F1101	K5D162BL0007	MINIATURE FUSE	⚠ VSF0244C16
F1101	K5D162BL0007	MINIATURE FUSE	⚠ K5Y162B00002
IC0701	C1AA00000606	IC	
IC1200	C0DAEJC00003	INTEGRATED CIRCUIT	UPC1093J-T
IC1501	B3EZ00000001	INTEGRATED CIRCUIT	RPI354N
IC1502	B3EZ00000001	INTEGRATED CIRCUIT	RPI354N
IC2501	AN3811NK-P	CYLINDER DRIVE IC	
IC3001	C1AB00001739	INTEGRATED CIRCUIT	
IC4501	AN3656NFBPBV	INTEGRATED CIRCUIT	
IC4902	C1AB00001614	INTEGRATED CIRCUIT	
IC6001	C2CBJG000262	INTEGRATED CIRCUIT	
IC6002	C3EAGC000015	EEPROM	M24C16-WBN6
IC6003	C1AB00001293	INTEGRATED CIRCUIT	*1, *2, *3, *4 SDA5650X
IC7501	C0HBB0000023	INTEGRATED CIRCUIT	M35502AFP-E1
IC7502	PNA4618M08VT	INTEGRATED CIRCUIT	
IC7503	C0EBE0000211	INTEGRATED CIRCUIT	
IC7504	C0EBH0000218	INTEGRATED CIRCUIT	
IC7601	C0EAH0000051	INTEGRATED CIRCUIT	PST7043-T
IC7602	C1AB00001404	INTEGRATED CIRCUIT	TDA9874AH
IP1001	----------	JUMPER WIRE	
JK4901	K1FB121B0003	CONNECTOR	
JK4902	K1FB121B0003	CONNECTOR	
JK4904	K2HA203B0012	AV	*1, *2, *3, *4
K0701	ECJ1VC1H560J	CHIP CAPACITOR	*1, *5 ECUV1H560JCV
K0703	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
K0707	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
K0709	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
K3004	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3016	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3017	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3018	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3024	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3025	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3027	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K3028	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4502	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4901	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4903	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4905	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4907	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4908	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4909	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4911	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K4912	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K5005	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K6001	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K6005	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K6006	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
K7611	J0JBC0000041	BEAD CORE	*3, *4 VLP0147-T

Ref. No.	Part No.	Part Name & Description	Remarks
K7613	ERJ6GEY0R00Z	CHIP RESISTOR	*3, *4 ERJ6GEY0R00V
K7615	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
L0701	ELJNAR27JF	CHIP INDUCTOR	*1, *3, *4, *5
L0701	ELJNAR22JF	CHIP INDUCTOR	*2
L0703	ELJNA2R2JF	CHIP INDUCTOR	*1, *3, *4, *5
L0703	ELJNA1R8JF	CHIP INDUCTOR	*2
L1120	ELF15N003AB	LINE FILTER	⚠ ELF15N003A
L1121	ELF15N005AB	LINE FILTER	⚠ ELF15N005A
L1250	G0A220G00018	FIXED INDUCTOR	
L1260	G0A220G00018	FIXED INDUCTOR	
L2501	G0C680JA0019	CHOKE COIL AXIAL	VLQ0599J680T
L3002	G0C820JA0019	CHOKE COIL AXIAL	
L3003	G0C270JA0019	CHOKE COIL AXIAL	VLQ0599J270T
L3004	G0C680JA0019	CHOKE COIL AXIAL	VLQ0599J680T
L3005	G0C270JA0019	CHOKE COIL AXIAL	VLQ0599J270T
L3006	G1C120J00001	FIXED INDUCTOR	
L3010	G0C390JA0019	CHOKE COIL AXIAL	VLQ0599J390T
L4001	----------	JUMPER WIRE	
L4002	G0C680JA0019	CHOKE COIL AXIAL	VLQ0599J680T
L4501	G0C1R2J00004	CHOKE COIL AXIAL	VLQ0599J1R2T
L4502	G0C1R2J00004	CHOKE COIL AXIAL	VLQ0599J1R2T
L4503	G0C100JA0019	CHOKE COIL AXIAL	VLQ0599J100T
L4503	G0C100JA0019	CHOKE COIL AXIAL	ELEXT100JBV
L4901	G0CR22JA0019	CHOKE COIL AXIAL	VLQ0599JR22T
L4902	G0C330JA0019	CHOKE COIL AXIAL	VLQ0599J330T
L4903	G0C330JA0019	CHOKE COIL AXIAL	VLQ0599J330T
L5001	G0C680JA0019	CHOKE COIL AXIAL	VLQ0599J680T
L6001	G0C101JA0019	CHOKE COIL AXIAL	ELEXT101JBV
L6001	G0C101JA0019	CHOKE COIL AXIAL	VLQ0599J101T
L6002	G0C330JA0019	CHOKE COIL AXIAL	*4 VLQ0599J330T
L6005	----------	JUMPER WIRE	
L6006	G0C680JA0019	CHOKE COIL AXIAL	*1, *2, *3, *4 VLQ0599J680T
L7601	G0C270JA0019	CHOKE COIL AXIAL	VLQ0599J270T
L7602	G0C270JA0019	CHOKE COIL AXIAL	VLQ0599J270T
L7603	G0C270JA0019	CHOKE COIL AXIAL	VLQ0599J270T
L7605	G0C2R2JA0019	CHOKE COIL AXIAL	VLQ0599J2R2T
L7606	----------	JUMPER WIRE	
L7607	G0C2R2JA0019	CHOKE COIL AXIAL	VLQ0599J2R2T
L7608	G0C1R0JA0019	CHOKE COIL AXIAL	VLQ0599J1R0T
L7609	----------	JUMPER WIRE	
LB0701	J0JBC0000041	BEAD CORE	*3, *4 VLP0147-T
LB1213	J0JHC0000070	BEAD CORE	
LB4001	J0JBC0000070	CHIP INDUCTOR	
LB4002	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
LB4003	J0JBC0000070	CHIP INDUCTOR	
LB4004	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
LB4901	J0JBC0000041	BEAD CORE	VLP0147-T
LB4902	J0JBC0000041	BEAD CORE	VLP0147-T
LB4903	J0JBC0000041	BEAD CORE	VLP0147-T
LB4904	J0JBC0000041	BEAD CORE	VLP0147-T
LB4905	J0JBC0000041	BEAD CORE	VLP0147-T

Ref. No.	Part No.	Part Name & Description	Remarks
LB4906	J0JBC0000041	BEAD CORE	VLP0147-T
LB4907	J0JBC0000041	BEAD CORE	VLP0147-T
LB4908	J0JBC0000041	BEAD CORE	VLP0147-T
LB4909	J0JBC0000041	BEAD CORE	*1, *2, *3, *4 VLP0147-T
LB4910	J0JBC0000041	BEAD CORE	*1, *2, *3, *4 VLP0147-T
LB4911	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
LB4912	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
LB4913	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
LB6001	J0JBC0000041	BEAD CORE	VLP0147-T
LB7601	J0JCC0000080	BEAD CORE	
LB7603	J0JCC0000124	BEAD CORE	
LB7604	J0JCC0000124	BEAD CORE	
LR1150	J1ZZA0000001	BEAD CORE	
P1101	K2AA2K000012	AC INLET	⚠
P1501	K1KB02A00035	CONNECTOR	VJS3837A002
P2501	K1KA12A00127	CONNECTOR	VJP3835E012
P2502	K1MN09A00023	CONNECTOR	
P4001	K1KB02A00035	CONNECTOR	VJS3837A002
P4002	K1MN06A00035	CONNECTOR	
P5001	K1MN10A00037	CONNECTOR	
PK0701	K1MR09A00028	CONNECTOR	
PP0701	K1KA04B00135	CONNECTOR	
Q0702	2SD0601ASL	TRANSISTOR	
Q1001	2SD0602ARL	TRANSISTOR	2SD602A-RTX
Q1002	B1AAGD000006	TRANSISTOR	
Q1003	2SB0710ARL	TRANSISTOR	2SB710A-RTX
Q1005	B1AAGD000006	TRANSISTOR	
Q1006	B1AAGD000006	TRANSISTOR	
Q1007	B1AAGD000006	TRANSISTOR	
Q1008	B1AAGD000006	TRANSISTOR	
Q1009	B1AAGD000006	TRANSISTOR	
Q1150	B1DEDR000003	TRANSISTOR	
Q1151	2SD1992ARA	TRANSISTOR	
Q1152	2SC3311ASA	TRANSISTOR	2SC3311ARA
Q1153	B1DEDQ000014	TRANSISTOR	
Q1200	B3PBA0000078	PHOTO COUPLER	⚠ PC123ZY2
Q1501	PNB2301MBV	TRANSISTOR	
Q1502	PNB2301MAV	TRANSISTOR	
Q3001	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q4003	2SD114900L	TRANSISTOR	2SD1149-TX
Q4004	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q4005	2SD0602ARL	TRANSISTOR	2SD602A-RTX
Q4006	2SB0710ARL	TRANSISTOR	2SB710A-RTX
Q4903	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q4904	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q4905	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q4906	2SD13280SL	TRANSISTOR	2SD1328-STX
Q6003	2SB0709ARL	TRANSISTOR	*4 2SB709A-RTX

Ref. No.	Part No.	Part Name & Description	Remarks
Q6004	2SB0709ARL	TRANSISTOR	*1, *2, *3, *4 2SB709A-RTX
Q6008	2SD0601ARN	TRANSISTOR	2SD601A-RTX
Q6009	2SD0601ARN	TRANSISTOR	2SD601A-RTX
QR1002	B1GBCFLL0002	TRANSISTOR	DTC124EK-T146
QR1003	UNR211200L	TRANSISTOR	
QR1004	B1GDCFJJ0002	TRANSISTOR	DTA114EK-T146
QR1005	UNR221100L	TRANSISTOR	UN2211-TX
QR4001	UNR221100L	TRANSISTOR	UN2211-TX
QR4002	B1GDCFJJ0002	TRANSISTOR	DTA114EK-T146
QR4005	B1GBCFLL0002	TRANSISTOR	DTC124EK-T146
QR4501	UNR211300L	TRANSISTOR	UN2113-TX
QR4502	UNR211300L	TRANSISTOR	UN2113-TX
QR4503	XN0121600L	MULTI.DIG.TRANSISTOR	
QR4504	XN0121600L	MULTI.DIG.TRANSISTOR	
QR4507	B1GBCFGA0002	TRANSISTOR	DTC143TK-T146
QR4901	B1GBCFJA0002	TRANSISTOR	DTC114TK-T146
QR4902	B1GBCFLL0002	TRANSISTOR	DTC124EK-T146
QR6001	B1GBCFJA0002	TRANSISTOR	DTC114TK-T146
QR6004	UNR221100L	TRANSISTOR	UN2211-TX
R0701	ERJ6GEYJ104V	CHIP RESISTOR	*2
R0705	ERJ3GEYJ472V	CHIP RESISTOR	ERJ3GSJ472V
R0707	ERJ3GEYJ393V	CHIP RESISTOR	ERJ3GSJ393V
R0708	ERJ3GEYJ332V	CHIP RESISTOR	ERJ3GSJ332V
R0709	ERJ6GEYJ104V	CHIP RESISTOR	*3, *4
R0711	ERJ3GEYJ181V	CHIP RESISTOR	
R0713	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
R0714	ERJ3GEYJ562V	CHIP RESISTOR	*3, *4 ERJ3GSJ562V
R0715	ERJ3GEYJ223V	CHIP RESISTOR	ERJ3GSJ223V
R0717	ERJ3GEYJ471V	CHIP RESISTOR	ERJ3GSJ471V
R0719	ERJ3GEYJ472V	CHIP RESISTOR	ERJ3GSJ472V
R0725	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R0727	ERJ3GEY0R00V	CHIP RESISTOR	ERJ3GS0R00V
R0728	ERJ3GEY0R00V	CHIP RESISTOR	*2 ERJ3GS0R00V
R0729	ERJ3GEYJ103V	CHIP RESISTOR	*1, *2, *5 ERJ3GSJ103V
R0730	ERJ6GEYJ103V	CHIP RESISTOR	*1, *5
R0731	ERJ3GEYJ101V	CHIP RESISTOR	*3, *4 ERJ3GSJ101V
R0732	ERJ3GEYJ472V	CHIP RESISTOR	*3, *4 ERJ3GSJ472V
R0740	ERJ3GEYG471V	CHIP RESISTOR	*1, *2, *5
R0740	ERJ3GEYG271V	CHIP RESISTOR	*3, *4
R0741	ERJ3GEYJ221V	CHIP RESISTOR	ERJ3GSJ221V
R0742	ERJ8GEYJ151V	CHIP RESISTOR	
R0745	ERJ6GEYJ335V	CHIP RESISTOR	
R1001	ERJ6GEYJ333V	CHIP RESISTOR	
R1003	ERJ6GEYJ273V	CHIP RESISTOR	
R1005	ERJ6GEYJ562V	CHIP RESISTOR	
R1006	ERJ6GEYJ562V	CHIP RESISTOR	
R1008	ERDS2TJ471T	CARBON RESISTOR	
R1009	ERDS2TJ471T	CARBON RESISTOR	
R1013	ERDS2TJ103T	CARBON RESISTOR	
R1014	ERJ6GEYJ472V	CHIP RESISTOR	
R1015	ERDS2TJ103T	CARBON RESISTOR	
R1016	ERJ6GEYJ103V	CHIP RESISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
R1017	ERJ6GEYJ103V	CHIP RESISTOR	
R1022	ERDS2TJ151T	CARBON RESISTOR	
R1024	ERJ6GEYJ562V	CHIP RESISTOR	
R1025	ERDS2TJ151T	CARBON RESISTOR	
R1150	ERDS2TJ105T	CARBON RESISTOR	
R1153	ERG2SJ331E	METAL OXIDE RESISTOR	
R1154	ERDS2TJ105T	CARBON RESISTOR	
R1155	ERDS2TJ104T	CARBON RESISTOR	
R1156	ERDS2TJ330T	CARBON RESISTOR	
R1157	EROS2TKG1801	METAL OXIDE RESISTOR	
R1158	ERDS2TJ331T	CARBON RESISTOR	
R1159	ERDS2TJ3R3T	CARBON RESISTOR	
R1160	ERX1SJR51E	METAL RESISTOR	
R1161	ERDS2TJ101T	CARBON RESISTOR	
R1162	ERDS2FJ102T	CARBON RESISTOR	
R1163	ERDS2FJ101T	CARBON RESISTOR	
R1200	ERJ6GEYG393V	CHIP RESISTOR	
R1202	ERJ6GEYG222V	CHIP RESISTOR	
R1203	ERJ6GEYG333V	CHIP RESISTOR	
R1204	ERJ6GEYJ123V	CHIP RESISTOR	
R1205	ERJ6GEYJ222V	CHIP RESISTOR	
R1206	ERJ6GEYJ271V	CHIP RESISTOR	
R1207	ERJ6GEYG333V	CHIP RESISTOR	
R1208	ERJ6GEYG822V	CHIP RESISTOR	
R1209	ERJ6GEYG563V	CHIP RESISTOR	
R1501	ERDS2TJ121T	CARBON RESISTOR	
R1502	ERDS2TJ181T	CARBON RESISTOR	
R1503	ERJ6GEYJ273V	CHIP RESISTOR	
R1504	ERJ6GEYJ273V	CHIP RESISTOR	
R1505	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R1506	ERJ6GEYJ103V	CHIP RESISTOR	
R2501	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R2502	ERJ6GEYJ222V	CHIP RESISTOR	
R2503	ERJ6GEYJ103V	CHIP RESISTOR	
R2504	ERJ6GEYJ103V	CHIP RESISTOR	
R2505	ERJ6GEYJ392V	CHIP RESISTOR	
R2506	ERJ6GEYJ105V	CHIP RESISTOR	
R2507	ERJ6GEYJ274V	CHIP RESISTOR	
R2508	ERJ6GEYG433V	CHIP RESISTOR	
R2509	ERDS2TJ331T	CARBON RESISTOR	
R2510	ERDS2TJ330T	CARBON RESISTOR	
R2511	ERDS2TJ330T	CARBON RESISTOR	
R2512	ERJ6GEYJ102V	CHIP RESISTOR	
R2515	ERDS2TJ330T	CARBON RESISTOR	
R2516	ERJ6GEYJ1R5V	CHIP RESISTOR	
R2517	ERJ6GEYJ1R2V	CHIP RESISTOR	
R3001	ERJ6GEYJ152V	CHIP RESISTOR	
R3002	ERJ6GEYJ622V	CHIP RESISTOR	
R3004	ERJ6GEYJ562V	CHIP RESISTOR	
R3005	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R3006	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R3009	ERJ6GEYJ153V	CHIP RESISTOR	
R3010	ERJ6GEYJ103V	CHIP RESISTOR	
R3011	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V

Ref. No.	Part No.	Part Name & Description	Remarks
R3012	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R3013	ERJ6GEYJ273V	CHIP RESISTOR	
R3014	ERJ6GEYJ471V	CHIP RESISTOR	
R3017	ERJ6GEYJ102V	CHIP RESISTOR	
R3027	ERJ6GEYJ332V	CHIP RESISTOR	
R3028	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R3030	ERJ6GEYJ106V	CHIP RESISTOR	
R3031	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R3033	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R3037	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R3038	ERJ6GEYJ221V	CHIP RESISTOR	
R4001	ERJ6GEYJ332V	CHIP RESISTOR	
R4002	ERJ6GEYJ104V	CHIP RESISTOR	
R4003	ERJ6GEYJ223V	CHIP RESISTOR	
R4004	ERJ6GEYJ221V	CHIP RESISTOR	
R4006	ERJ6GEYJ223V	CHIP RESISTOR	
R4007	ERJ6GEYJ103V	CHIP RESISTOR	
R4008	ERJ6GEYJ334V	CHIP RESISTOR	
R4009	ERJ6GEYJ333V	CHIP RESISTOR	
R4010	ERJ6GEYJ103V	CHIP RESISTOR	
R4011	ERJ6GEYJ243V	CHIP RESISTOR	
R4012	ERJ6GEYJ821V	CHIP RESISTOR	
R4013	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R4014	ERJ6GEYJ163V	CHIP RESISTOR	
R4015	ERJ6GEYJ472V	CHIP RESISTOR	
R4016	ERJ6GEYJ222V	CHIP RESISTOR	
R4017	ERJ6GEYJ332V	CHIP RESISTOR	
R4018	ERJ6GEYJ472V	CHIP RESISTOR	
R4019	ERJ6GEYJ682V	CHIP RESISTOR	
R4020	ERJ6GEYJ472V	CHIP RESISTOR	
R4503	ERJ6GEYJ303V	CHIP RESISTOR	
R4504	ERJ6GEYJ303V	CHIP RESISTOR	
R4507	ERJ6GEYJ153V	CHIP RESISTOR	
R4508	ERJ6GEYJ472V	CHIP RESISTOR	
R4509	ERJ6GEYJ472V	CHIP RESISTOR	
R4510	ERJ6GEYJ153V	CHIP RESISTOR	
R4511	ERJ6GEYJ472V	CHIP RESISTOR	
R4512	ERJ6GEYJ472V	CHIP RESISTOR	
R4513	ERJ6GEYJ563V	CHIP RESISTOR	
R4514	ERJ6GEYJ563V	CHIP RESISTOR	
R4515	ERJ6GEYJ563V	CHIP RESISTOR	
R4516	ERJ6GEYJ563V	CHIP RESISTOR	
R4517	ERJ6GEYJ511V	CHIP RESISTOR	
R4518	ERJ6GEYJ472V	CHIP RESISTOR	
R4519	ERJ6GEYJ821V	CHIP RESISTOR	
R4520	ERJ6GEYJ124V	CHIP RESISTOR	
R4521	ERJ6GEYJ472V	CHIP RESISTOR	
R4522	ERJ6GEYJ511V	CHIP RESISTOR	
R4523	ERJ6GEYJ102V	CHIP RESISTOR	
R4524	ERJ6GEYJ303V	CHIP RESISTOR	
R4525	ERJ6GEYJ102V	CHIP RESISTOR	
R4526	ERJ6GEYJ102V	CHIP RESISTOR	
R4527	ERJ6GEYJ223V	CHIP RESISTOR	
R4531	ERJ6GEYJ221V	CHIP RESISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
R4533	ERJ6GEYJ221V	CHIP RESISTOR	
R4535	ERJ6GEYJ221V	CHIP RESISTOR	
R4537	ERJ6GEYJ103V	CHIP RESISTOR	
R4538	ERJ6GEYJ221V	CHIP RESISTOR	
R4539	ERJ6GEYJ362V	CHIP RESISTOR	
R4540	ERJ6GEYJ223V	CHIP RESISTOR	
R4543	ERJ6GEYJ221V	CHIP RESISTOR	
R4906	ERJ6GEYJ750V	CHIP RESISTOR	
R4907	ERJ6GEYJ750V	CHIP RESISTOR	
R4909	ERJ6GEYJ750V	CHIP RESISTOR	
R4911	ERJ6GEYJ750V	CHIP RESISTOR	
R4912	ERJ6GEYJ103V	CHIP RESISTOR	
R4913	ERJ6GEYJ103V	CHIP RESISTOR	
R4914	ERJ6GEYJ223V	CHIP RESISTOR	
R4915	ERJ6GEYJ183V	CHIP RESISTOR	
R4916	ERDS2TJ471T	CARBON RESISTOR	
R4917	ERJ6GEYJ223V	CHIP RESISTOR	
R4918	ERJ6GEYJ153V	CHIP RESISTOR	
R4919	ERJ6GEYJ474V	CHIP RESISTOR	
R4920	ERJ6GEYJ472V	CHIP RESISTOR	
R4921	ERJ6GEYJ472V	CHIP RESISTOR	
R4922	ERJ6GEYJ472V	CHIP RESISTOR	
R4923	ERJ6GEYJ681V	CHIP RESISTOR	
R4924	ERJ6GEYJ681V	CHIP RESISTOR	
R4926	ERJ6GEYJ393V	CHIP RESISTOR	
R4935	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R6001	ERJ6GEYJ472V	CHIP RESISTOR	
R6002	ERJ6GEYJ102V	CHIP RESISTOR	
R6003	ERJ6GEYJ391V	CHIP RESISTOR	
R6004	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R6005	ERJ6GEYJ224V	CHIP RESISTOR	
R6006	ERJ6GEYJ152V	CHIP RESISTOR	*4
R6007	ERJ6GEYJ473V	CHIP RESISTOR	*1, *2, *3, *5
R6009	ERJ6GEYJ223V	CHIP RESISTOR	
R6011	ERJ6GEYJ221V	CHIP RESISTOR	
R6012	ERJ6GEYJ221V	CHIP RESISTOR	
R6013	ERJ6GEYJ221V	CHIP RESISTOR	
R6017	ERJ6GEYJ102V	CHIP RESISTOR	
R6019	ERJ6GEYJ103V	CHIP RESISTOR	
R6020	ERJ6GEYJ393V	CHIP RESISTOR	
R6021	ERJ6GEYJ273V	CHIP RESISTOR	
R6022	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R6023	ERJ6GEYJ273V	CHIP RESISTOR	
R6025	ERJ6GEYJ433V	CHIP RESISTOR	
R6026	ERJ6GEYJ393V	CHIP RESISTOR	
R6031	ERJ6GEYJ682V	CHIP RESISTOR	
R6035	ERJ6GEYJ681V	CHIP RESISTOR	
R6036	ERJ6GEYJ681V	CHIP RESISTOR	
R6039	ERJ6GEYJ102V	CHIP RESISTOR	
R6040	ERJ6GEYJ102V	CHIP RESISTOR	
R6041	ERJ6GEYJ102V	CHIP RESISTOR	
R6046	ERJ6GEYJ472V	CHIP RESISTOR	
R6047	ERJ6GEYJ472V	CHIP RESISTOR	
R6048	ERJ6GEYJ472V	CHIP RESISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
R6049	ERJ6GEYJ221V	CHIP RESISTOR	
R6051	ERJ6GEYJ564V	CHIP RESISTOR	*1, *2, *3, *4
R6052	ERJ6GEYJ221V	CHIP RESISTOR	*1, *2, *3, *4
R6053	ERJ6GEYJ682V	CHIP RESISTOR	*1, *2, *3, *4
R6054	ERJ6GEYJ125V	CHIP RESISTOR	*1, *2, *3, *4
R6055	ERJ6GEYJ682V	CHIP RESISTOR	*1, *2, *3, *4
R6056	ERJ6GEYJ125V	CHIP RESISTOR	*1, *2, *3, *4
R6057	ERJ6GEYJ104V	CHIP RESISTOR	*1, *2, *3, *4
R6058	ERJ6GEYJ222V	CHIP RESISTOR	*1, *2, *3, *4
R6059	ERJ6GEYJ222V	CHIP RESISTOR	*1, *2, *3, *4
R6060	ERJ6GEYJ102V	CHIP RESISTOR	*1, *2, *3, *4
R6061	ERJ6GEYJ102V	CHIP RESISTOR	*1, *2, *3, *4
R6071	ERJ6GEYJ183V	CHIP RESISTOR	
R6072	ERJ6GEYJ223V	CHIP RESISTOR	
R6073	ERJ6GEYJ474V	CHIP RESISTOR	
R6074	ERDS2TJ471T	CARBON RESISTOR	
R6075	ERJ6GEYJ223V	CHIP RESISTOR	
R6076	ERJ6GEYJ153V	CHIP RESISTOR	
R6077	ERJ6GEYJ105V	CHIP RESISTOR	
R6078	ERJ6GEYJ471V	CHIP RESISTOR	
R6083	ERJ6GEYJ222V	CHIP RESISTOR	
R7501	ERJ6GEYJ822V	CHIP RESISTOR	
R7502	ERJ6GEYJ562V	CHIP RESISTOR	
R7503	ERJ6GEYJ432V	CHIP RESISTOR	
R7504	ERJ6GEYJ822V	CHIP RESISTOR	
R7505	ERJ6GEYJ562V	CHIP RESISTOR	
R7506	ERJ6GEYJ432V	CHIP RESISTOR	
R7507	ERDS2TJ390T	CARBON RESISTOR	
R7509	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7510	ERDS2TJ821T	CARBON RESISTOR	
R7511	ERDS2TJ821T	CARBON RESISTOR	
R7512	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R7513	ERJ6GEYJ303V	CHIP RESISTOR	
R7514	ERJ6GEYJ303V	CHIP RESISTOR	
R7515	ERJ6GEYJ303V	CHIP RESISTOR	
R7516	ERJ6GEYJ303V	CHIP RESISTOR	
R7517	ERJ6GEYJ103V	CHIP RESISTOR	
R7518	ERJ6GEYJ103V	CHIP RESISTOR	
R7519	ERJ6GEYJ432V	CHIP RESISTOR	
R7520	ERJ6GEYJ123V	CHIP RESISTOR	
R7521	ERJ6GEYJ223V	CHIP RESISTOR	
R7522	ERJ6GEYJ822V	CHIP RESISTOR	
R7534	ERJ6GEYJ181V	CHIP RESISTOR	
R7535	ERJ6GEYJ103V	CHIP RESISTOR	
R7536	ERJ6GEYJ562V	CHIP RESISTOR	
R7537	ERJ6GEYJ123V	CHIP RESISTOR	
R7538	ERJ6GEYJ123V	CHIP RESISTOR	
R7603	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R7605	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7606	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7607	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7608	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7611	ERDS2TJ331T	CARBON RESISTOR	
R7612	ERDS2TJ331T	CARBON RESISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
R7613	ERJ6GEYJ151V	CHIP RESISTOR	
R7614	ERJ6GEYJ151V	CHIP RESISTOR	
R7615	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R7618	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7619	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7620	ERJ6GEYJ101Z	CHIP RESISTOR	ERJ6GEYJ101V
R7623	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R7626	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
R7628	ERJ6GEYJ103V	CHIP RESISTOR	
R7629	ERJ6GEYJ221V	CHIP RESISTOR	
R7631	ERJ6GEYJ221V	CHIP RESISTOR	
R7632	ERJ6GEYJ221V	CHIP RESISTOR	
R7637	ERJ6GEYJ221V	CHIP RESISTOR	
S1501	EVQWJCA01	MODE SELECT SWITCH	
S7501	EVQ11L07B	SWITCH	
S7502	EVQ11L07B	SWITCH	
S7503	EVQ11L07B	SWITCH	
S7504	EVQ11L07B	SWITCH	
S7505	EVQ11L07B	SWITCH	
S7506	EVQ11L07B	SWITCH	
S7507	K0C111A00006	SAFETY TAB SWITCH	
S7508	EVQ11L07B	SWITCH	
S7510	EVQ11L07B	SWITCH	
S7511	EVQ11L07B	SWITCH	
S7512	EVQ11404M	SWITCH	
S7513	EVQ11L07B	SWITCH	
S7514	EVQ11404M	SWITCH	
S7515	EVQ11L07B	SWITCH	
S7516	EVQ11L07B	SWITCH	
S7517	EVQ11L07B	SWITCH	
T0701	EQV5EC082P	TRANSFORMER	*1, *5
T0701	EQV5EC083P	TRANSFORMER	*2
T0701	EQV5EC081P	TRANSFORMER	*3, *4
T1150	ETS29AZ286AC	TRANSFORMER	⚠
T4001	EQQ7QF024P	HIGH FREQUENCY COIL	EQQ7QF024Q
TU7601	ENG47327G1	TUNER	⚠ *1, *5
TU7601	ENG47328G1	TUNER	⚠ *2
TU7601	ENG47329G1	TUNER	⚠ *3, *4
VR0701	EVNCYAA03B14	VARIABLE RESISTOR	
W501	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W502	ERJ8GEY0R00V	CHIP RESISTOR	
W503	ERJ8GEY0R00V	CHIP RESISTOR	
W504	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W506	ERJ8GEY0R00V	CHIP RESISTOR	
W507	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W508	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W509	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W510	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V

Ref. No.	Part No.	Part Name & Description	Remarks
W511	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W512	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W513	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W514	ERJ8GEY0R00V	CHIP RESISTOR	
W515	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W516	ERJ8GEY0R00V	CHIP RESISTOR	
W517	ERJ8GEY0R00V	CHIP RESISTOR	
W701	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W702	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W703	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W704	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W705	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W706	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W707	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W708	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W709	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W710	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W711	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W712	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W713	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W714	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W715	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W716	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W717	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W718	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W719	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W720	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W721	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W722	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W723	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W724	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W725	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W726	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W727	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W728	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W729	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W730	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W731	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W732	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W733	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W734	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W735	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
W736	ERJ6GEY0R00Z	CHIP RESISTOR	ERJ6GEY0R00V
X0701	J0B4045A0002	CRISTAL OSCILLATOR	*1, *5
X0701	J0B4155A0003	CRISTAL OSCILLATOR	*2
X0701	J0B3955A0001	CRISTAL OSCILLATOR	*3, *4
X0702	J0B4055A0001	CRISTAL OSCILLATOR	*3, *4
X0704	VLF1493	FILTER	*1, *5
X0704	VLF1495	FILTER	*2
X0704	VLF1497	FILTER	*3, *4
X3001	H0D443400039	CRISTAL OSZILLATOR	
X6001	H0A120500002	CRYSTAL OCSILLATOR	
X6002	VSX1022	QUARZ	

Ref. No.	Part No.	Part Name & Description	Remarks
X7601	H0D245500011	QUARZ	VSX0953-T
		MISCELLANEOUS	
	EYF52BC	FUSE HOLDER	
	EYF52BC	FUSE HOLDER	
	VSC4998	SHIELD CASE	
	VMP4471	ANGLE	
■	----------	CYLINDER STATOR C.B.A.	
		MISCELLANEOUS	
	VJS3537F009G	CONNECTOR (FEMALE) 9P	K1MN09B00039
	HW-300A-DF	HALL IC	B4AAB0000007
1	VEG1598	CYLINDER UNIT	
2	VXP2170	UPPER CYLINDER UNIT	
3	VDB1256	CYLINDER RETAINER	
4	VEM0715	CYLINDER MOTOR UNIT	⚠
6	VXS0135	EARTH BRUSH UNIT	
7	VMD3795	FLAT CABLE HOLDER	
10	VEK9069	CAPSTAN UNIT	
11	L1AZ00000004	FE HEAD	
12	VDB1431	TENSION ARM BOSS	
13	VDB1460	SUPPLY BRAKE ARM BOSS	
14	VDG1220KIT	MAIN CAM GEAR	
15	VDG1221	CONVERSION GEAR	
16	VDR0350	REEL TABLE	
17	VDR0350	REEL TABLE	
18	VDV0382	CAPSTAN BELT	
19	VED0412	A/C HEAD UNIT	
20	VMX2656	P4 CAP	
21	VDG1217	WORM GEAR	
22	VDG1218	WORM WHEEL GEAR	
23	VDG1219	CENTRE GEAR	
24	VEM0604	LOADING MOTOR UNIT	
25	VMD2619	MOTOR BRACKET	
26	VMB3045	CONVERSION GEAR SPRING	
27	VMD2620	OPENER PIECE	
28	VMD2738	LED PRISM	
29	VML3165	DRIVE RACK ARM	
30	VML3166	MAIN LEVER	
31	VML3167	DRIVE MAIN LEVER ARM	
32	VML3172	SUPPLY SPRING ARM	
33	VML3176	CONVERSION LEVER A	
34	VML3177	CONVERSION LEVER B	
35	VXA6040	INCLINED BASE (S) UNIT	
36	VXA5854	INCLINED BASE (T) UNIT	

Ref. No.	Part No.	Part Name & Description	Remarks
37	VXP1891	ROLLER POST	
38	VXP1891	ROLLER POST	
39	VMA9672	SUPPORT ANGLE	
41	VXL2667	TAKE UP BRAKE ARM UNIT	
43	VXL2670	TAKE UP LOADING ARM UNIT	
44	VXL2798	TENSION ARM UNIT	
45	VXL2672	SUPPLY LOADING ARM UNIT	
46	VXL2785	PINCH ARM UNIT	
47	VXL2996	P5 ARM UNIT	
48	VXL2792	IDLER ARM UNIT	
49	VXL2733	SUPPLY BRAKE ARM UNIT	
50	VXL2747	LOADING RACK UNIT	
51	VXP2035	CENTRE CLUTCH UNIT	
56	VDP1660	MOTOR COUPLING	
60	VMA9516	TOP PLATE	
61	VMB3047	CONNECTION SPRING	
62	VMD3379	SIDE PLATE (L)	
63	VXA6540	SIDE PLATE (R) UNIT	
64	VXA5746	CASSETTE HOLDER UNIT	
65	VXP1730	MAIN SHAFT UNIT	
B1	VHD1117	SCREW	
B2	VHD1117	SCREW	
B3	VHD0842	SCREW	
B4	VHD0843	SCREW	
B5	VHD0843	SCREW	
B6	VHD0844	SCREW	
B7	VHD0844	SCREW	
B8	VHD1066	SCREW	
B9	VHD1066	SCREW	
B10	VHD1044	SCREW	
B11	VHD1060	SCREW	
B12	VHD1071	SCREW	
B13	XTS26+6F	SCREW	
B14	XTN26+6F	SCREW	
B15	XTN26+7J	SCREW	
B16	XTN26+7J	SCREW	
B17	XTN26+7J	SCREW	
B18	VHD1095	SCREW	
B19	VHD1185	SCREW	
N1	VHN0311	PUSH NUT	
W1	VMX2208	WASHER	
W2	VMX3022	WASHER	
W3	VMX3022	WASHER	
101	VGM1993	TOP PANEL black	NV-HV60EB-K/EC-K/EP-K
101	VGM1990	TOP PANEL silver	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
102	VYP8758	FRONT PANEL UNIT	NV-HV50EC-S
102	VYP8756	FRONT PANEL UNIT	NV-HV55EC-S
102	VYP8748	FRONT PANEL UNIT	NV-HV60EB-K
102	VYP8747	FRONT PANEL UNIT	NV-HV60EB-S/EBL-S
102	VYP8746	FRONT PANEL UNIT	NV-HV60EC-K

Ref. No.	Part No.	Part Name & Description	Remarks
102	VYP8745	FRONT PANEL UNIT	NV-HV60EC-S
102	VYP8751	FRONT PANEL UNIT	NV-HV60EP-K
102	VYP8750	FRONT PANEL UNIT	NV-HV60EP-S
102	VYP8754	FRONT PANEL UNIT	NV-HV65EC-S
103	RKA0072-K	LEG	
104	RKA0072-K	LEG	
107	VGB0554	SUPER DRIVE BADGE	
108	VKF3686	BLINDER PANEL	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
108	VKF3704	BLINDER PANEL	NV-HV60EB-K/EC-K/EP-K
109	VMB2521	BLINDER SPRING	
111	VKU0575	BOTTOM PLATE(VCR)	
112	VMZ3099-W	V0 SHEET	⚠
113	VJH1175	JACK BOARD	
114	VJH1174	ANT BOARD	NV-HV50
114	VJH1234	ANT BOARD HV60	NV-HV55/60/65
120	VWJ1651	FFC (P4002-A/C HEAD)	
121	VWJ1282	FFC (P2502-CYL)	⚠
B101	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B101	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B102	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B102	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B103	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B103	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B104	XTW3+10TFC	SCREW TOP CASE	NV-HV50EC-S/55EC-S/60EBL-S/60EB-S/60EC-S/60EP-S/65EC-S
B104	XTW3+10TFZ	SCREW	NV-HV60EB-K/EC-K/EP-K
B105	VHD0168	SCREW FOR MECHA.CHAS	
B106	VHD0168	SCREW FOR MECHA.CHAS	
B107	VHD1092	SCREW	
B108	VHD1092	SCREW	
B109	VHD1092	SCREW	
B110	VHD1092	SCREW	
B111	VHD1092	SCREW	
B112	VHD1092	SCREW	
B113	VHD1092	SCREW	
B114	XTV26+8FR-NC	TAPPING SCREW	
B115	XTV26+8FR-NC	TAPPING SCREW	
B116	XTV26+8FR-NC	TAPPING SCREW	
B117	XTV26+8FR-NC	TAPPING SCREW	
B118	XTV3+8GFZ	TAPPING SCREW	NV-HV55/60/65
201	RQTD0038-A	OPERATING INSTRUCTIONS (ENGLISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S/60EP-S/60EP-K
201	RQTD0037-D	OPERATING INSTRUCTIONS (GERMAN)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0042-C	OPERATING INSTRUCTIONS (FRENCH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S

Ref. No.	Part No.	Part Name & Description	Remarks
201	RQTD0041-H	OPERATING INSTRUCTIONS (DUTCH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0043-B	OPERATING INSTRUCTIONS (ENGLISH)	⚠ NV-HV60EB-S/60EB-K/60EBL-S
201	RQTD0050-T	OPERATING INSTRUCTIONS (HUNGARIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0051-R	OPERATING INSTRUCTIONS (RUSSIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0052-S	OPERATING INSTRUCTIONS (CZECHOSLOVAKIAN)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0053-Q	OPERATING INSTRUCTIONS (POLISH)	⚠ NV-HV60EP-S/60EP-K
201	RQTD0045-K	OPERATING INSTRUCTIONS (FINISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0046-J	OPERATING INSTRUCTIONS (DANISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0047-U	OPERATING INSTRUCTIONS (PORTUGUESE)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0048-Z	OPERATING INSTRUCTIONS (SWEDISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
201	RQTD0049-M	OPERATING INSTRUCTIONS (SPANISH)	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/65EC-S
202	N2QAHB000031	REMOTE CONTROLLER	NV-HV50EC-S
202	N2QAKB000043	REMOTE CONTROLLER	NV-HV55EC-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
202	N2QAKB000044	REMOTE CONTROLLER	NV-HV60EB-S/60EB-K/60EBL-S
203	R0185-720010	BATTERY COVER	NV-HV50EC-S
203	R0186-720010	BATTERY COVER	NV-HV55EC-S/60EB-S/60EB-K/60EBL-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
205	K2KF2BA00001	DIN RF CABLE	
206	RJA0043-1C	AC CABLE	⚠ NV-HV50EC-S/55EC-S/60EC-S/60EC-K/60EP-S/60EP-K/65EC-S
206	RJA0044-3C	AC CABLE	⚠ NV-HV60EB-S/60EB-K/60EBL-S
210	VPK2246	ACCESSORY CASE	
211	VPN5491	CUSHION L (VHS)	
212	VPN5492	CUSHION R (VHS)	
215	VPG0T30	PACK.CASE HV50 S	NV-HV50EC-S
215	VPG0T29	PACK.CASE HV55 S	NV-HV55EC-S
215	VPG0T26	PACK.CASE HV60 K	NV-HV60EB-K/EC-K/EP-K
215	VPG0T25	PACK.CASE HV60 S	NV-HV60EBL-S/EB-S/EC-S/EP-S
215	VPG0T27	PACK.CASE HV65 S	NV-HV65EC-S
		SERVICE FIXTURES & TOOLS	
	VFJ8125H3F	VHS ALIGNMENT TAPE (PAL)	[AVC-SPC]
	VFK0335	RETAINING RING REMOVER (3mm/4mm)	[AVC-SPC]
	VFK0329	POST ADJUSTMENT SCREWDRIVER	[AVC-SPC]
	VFK0326	HEX WRENCH SET	[AVC-SPC]
	VFK0132	BACK TENSION METER	[AVC-SPC]
	VFK27	HEAD CLEANING STICK	[AVC-SPC]
	VFK1024	MOLYTONE GREASE	[AVC-SPC]
	VFK0330	FINE ADJUSTMENT GEAR DRIVER	[AVC-SPC]
	VFK1301	SILICONE GREASE	[AVC-SPC]
	VFK1298	FLOIL GREASE	[AVC-SPC]

12. SCHEMATIC DIAGRAM FOR PRINTING WITH A4 SIZE

Ⓟ :TO POWER TRANSFORMER SECTION
Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
Ⓐ :TO Hi-Fi AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓣ :TO TIMER SECTION
Ⓓ :TO DECODER SECTION

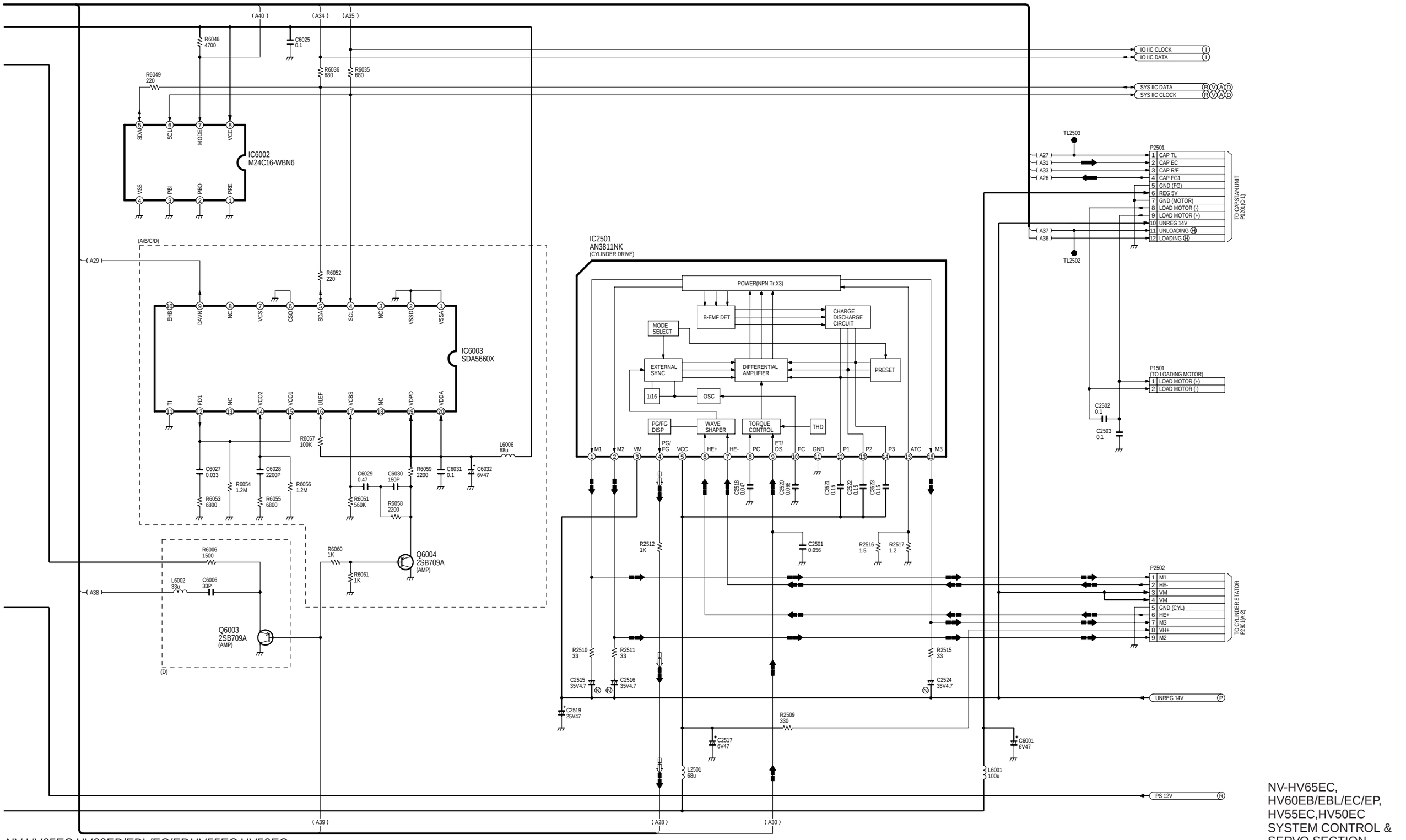
CAPSTAN SERVO SPEED LOOP
CAPSTAN SERVO PHASE LOOP
CYLINDER SERVO SPEED LOOP
CYLINDER SERVO PHASE LOOP

R N.SW 5V
T BACK UP 5V
R SLEEP Ⓗ
V Y/C VIDEO OUT (A19)
V FSC (A18)
R POWER OFF Ⓛ (A17)
R FIP Ⓛ (A16)
I VIDEO OUT (A15)
A RFC MUTE Ⓗ (A14)
T FIP CS (A11)
V MESECAM DET Ⓗ (A10)
T S.DATA (A8)
T S.CLOCK (A7)
T P.FAIL Ⓛ (A6)
T POWER KEY (A2)
T SAFETY TAB Ⓛ (A1)
R AFC S-CURVE (B1)
V TRACKING ENV. (B2)
V KILLER Ⓛ (B4)
V PAL EP Ⓗ (B5)
I AV2 PB Ⓗ (B6)
V FREQ.ADJ (B7)
V ART V/H/N (B8)
T IR (B9)
V HEAD SW (B10)
A A.HEAD SW (B11)
I PROG Ⓗ (B12)
A ABS NORMAL Ⓗ (B14)
A D.FM REC Ⓗ (B16)
V D.A.REC Ⓗ (B17)
V BIAS Ⓗ (B18)
V A MUTE Ⓗ (B19)
R SW2 (B20)
V S-VHS DET Ⓗ (B21)
T RESET Ⓛ (B22)
I AV1 PB Ⓗ (B23)
V CYL HEAD (-)
V CYL HEAD (+)
R REG 5V
R PS 5V
MODE SW S1501 K0G934A00002 (B25 B26 B27)
R GND
R GND (SYS)
R GND (FIP)
R GND (CTL)
R GND (FG)
R GND (MOTOR)

QR6004 UN2211 (SLEEP Ⓛ :OFF)
R1017 10K
IC1502 RPI354N (S-REEL)
IC1501 RPI354N (T-REEL)
TL6013 TL6012
TW6002 TW2015 TW2002 TW2001
TL6010
R1502 180
R1503 27K R1504 27K
R1506 10K
R6001 4700
C2512 25V4.7
C2511 6V22
R6031 6800
C6017 680P
C6041 0.1
C2514 0.1
C2508 0.1
C2513 3900P
R6019 10K
R6020 39K
R1501 120
R6021 27K
R6025 43K
R6022 100
R6026 39K
C6016 0.01
C6015 16V10
R6023 27K
R2507 270K
R2508 43K
Q1501 PNB2301MBV (T-PHOTO)
SENSOR D1501 SIR505S
Q1502 PNB2301MAV (S-PHOTO)
C2509 0.47
R2505 3900
C2510 33P
R2506 1M
D2501 MA165
D2502 MA165
R2501 0
C2506 0.056
R2502 2200
R2504 10K
R2503 10K
C2505 0.056
C2507 0.056
C6038 22P
C6039 22P
R6047 4700
R6048 4700
R6011 220
R6012 220
R6013 220
R6007 47K (A/B/C/E)
C6042 0.01
LB6001 J0JBC0000041
L6005 0
C6024 6V220
R6040 1K
R6041 1K
C6040 0.1
R6078 470
C6035 1
C6036 560P
R6077 1M
C6022 220P
C6023 1
R6039 1K
Q6009 2SD601A (AMP)
R6003 390
C6004 0.01
R6002 1K
C6003 470P
C6005 0.01
R6009 22K
R6004 0
C6009 18P
X6001 H0A120500002
C6010 18P
R6005 220K
C6011 18P
X6002 VSX1022
C6012 15P
R6072 22K
Q6008 2SD601A (AV1 PB:ON)
QR6001 UN2215 (SWITCHING)
D6004 1SS355
R6073 470K
R6071 18K
R6074 470
R6075 22K
R6076 15K
R6017 1K
R6083 2200
R1505 100

IC6001 C2CBJG000262

| | | |



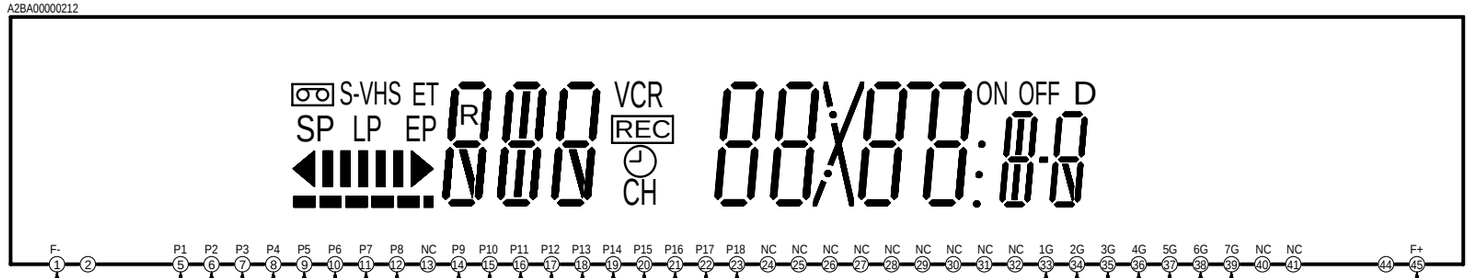
NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
SYSTEM CONTROL & SERVO SECTION SCHEMATIC DIAGRAM

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
SYSTEM CONTROL &
SERVO SECTION
SCHEMATIC DIAGRAM

Ⓟ :TO POWER TRANSFORMER SECTION
Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓐ :TO Hi-Fi AUDIO SECTION

DP7501
A2BA00000212



F- 1 2 | P1 5 P2 6 P3 7 P4 8 P5 9 P6 10 P7 11 P8 12 NC 13 P9 14 P10 15 P11 16 P12 17 P13 18 P14 19 P15 20 P16 21 P17 22 P18 23 NC 24 NC 25 NC 26 NC 27 NC 28 NC 29 NC 30 NC 31 NC 32 | 1G 33 2G 34 3G 35 4G 36 5G 37 6G 38 7G 39 NC 40 NC 41 | 44 45 F+

Ⓡ HEATER (+)
R7507 39
C7501 0.01
Ⓟ HEATER DC (-)
D7501 MA4240NM
C7502 50V10
R7511 820
R7510 820
Ⓡ FIP -29V
R7509 100

S1 -10.1 | S2 -15.3 | S3 -25.3 | S4 -25.3 | S5 -10.1 | S6 -25.3 | S7 -20.3 | S8 -20.3 | S9 -20.3 | S10 -15.3 | S11 -20.2 | S12 -20.2 | S13 -15.3 | S14 -15.3 | S15 -20.4 | S16 -25.3 | S17 -20.4 | VEE -29.4

IC7501
M35502AFP

S DATA 1 4.7 | S CLOCK 2 4.8 | CS Ⓛ 3 2.4 | A3 4 5.2 | A2 5 5.2 | A5 6 5.2 | A4 7 5.2 | VSS 8 | OSC 9 2.3 | VCC 10 5.2 | G1 11 -25.7 | G2 12 -25.7 | G3 13 -25.7 | G4 14 -21.1 | G5 15 -21.1 | G6 16 -25.7 | G7 17 -25.7 | S18 18 -29.4

R7512 0
C7503 12P

Ⓢ S.DATA
Ⓢ S.CLOCK
Ⓢ FIP CS
Ⓢ SAFETY TAB Ⓛ
SAFETY TAB
S7507 K0C111A00006
POWER
S7506 EVQ11L07B
Ⓢ POWER KEY
R7521 22K
Ⓢ IR
Ⓡ N.SW 5V
Ⓡ GND
Ⓢ P.FAIL Ⓛ
Ⓢ RESET Ⓛ
Ⓢ BACK UP 5V

IC7502
PNA4618M08V
(IR RECEIVER)
R OUT 1 5.2 | GND 2 | VCC 3 5.2

R7517 10K
R7518 10K
R7513 30K
R7515 30K
R7516 30K
R7514 30K

C7512 0.1

IC7504
C0EBH0000218
(RESET)
RST 1 5.2 | VDD 2 5.2 | VSS 3 | 4 | 5
C7511 0.1

IC7503
C0EBE0000211
(RESET)
OUT 1 4.9 | VDD 2 4.9 | GND 3 | CD 5 2.2 | 4 0
C7504 6V100
C7510 0.01
R7535 10K
C7509 6800P

D7503 RB441PT-77
R7534 180
C7507 VCE0073 *1
C7508 6V220

CH UP S7504 EVQ11L07B
QUICK ERASE S7503 EVQ11L07B
PLAY S7511 EVQ11L07B
REW S7512 EVQ11404M
R7506 4300
R7505 5600
R7504 8200
R7537 12K

CH DOWN S7502 EVQ11L07B
REC S7501 EVQ11L07B
STOP S7515 EVQ11L07B
TIMER REC S7513 EVQ11L07B
FF S7514 EVQ11404M
R7503 4300
R7502 5600
R7501 8200
R7538 12K

EXT LINK S7508 EVQ11L07B
EJECT S7505 EVQ11L07B
PROG PLAY S7516 EVQ11L07B
INTELLIGENT TIMER S7510 EVQ11L07B
TIMER CHECK S7517 EVQ11L07B
R7519 4300
R7536 5600
R7522 8200
R7520 12K

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
TIMER SECTION SCHEMATIC DIAGRAM

F E D C B A
1 2 3 4 5 6 7 8 9

VIDEO SIGNAL PATH

AUDIO SIGNAL PATH

(C/D)
R0714 5600
R0732 4700
R0731 100
LB0701 VLP0147

R0713 0

R0740 470:A/B/E 270:C/D

C0724 220P:A/C/D/E 330P:B

R0717 470

R0711 180

R0745 3.3M

C0707 50V2.2

T0701 EVQ5EC082P:A/E EVQ5EC083P:B EVQ5EC081P:C/D

R0729 10K (A/B/E)
R0730 10K (A/E)
R0701 100K (B)

(B) R0728 0

(C/D) R0709 100K

R0727 0

C0719 0.1

C0708 50V 0.47

C0717 33P

PK0701

DU7601-19	SW1	1
DU7601-20	SW2	2
DU7601-21	———	3
DU7601-22	SIF OUT	4
DU7601-23	AFC S-CURVE	5
DU7601-24	TUNER VIDEO	6
DU7601-25	REG 5V	7
DU7601-26	———	8
DU7601-27	GND	9

TO POWER SUPPLY/ RF SECTION DU7601 (B-9)

1.6
2.4
2.6
5.0

R0742 150

Q0702 2SD601A (AMP)
3.6
3.3
2.6

R0741 220

C0721 120P:A/E 82P:B 56P:C/D

R0743 1K

IC0701 LA75503

3.1 2.4 1.6 3.0 2.7 2.2 3.3 4.3 4.3 1.8 0 1.3
1 2 3 4 5 6 7 8 9 10 11 12

BPF
AMP SW
EQ AMP
LPF
VCO
FLL
TRAP
BPF
AGC
AFT AMP
LIM AMP
VIDEO DET
APC DET
1ST SIF DET
S PLL
FM DET
FIL CONT
VIF AMP
IF AGC
1ST AMP
DEEMPHP
RF AGC

2.6 2.4 2.2 3.3 2.8 2.8 5.0 1.6 0.1 4.0 2.4
24 23 22 21 20 19 18 17 16 15 14 13

D0702 0

C0701 1

C0713 6V330

C0704 0.033

C0714 1

R0705 4700

R0708 10K

VR0701 10KB

R0707 39K

C0702 1000P

C0703 1

R0719 4700

C0712 0.1

X0704 VLF1493:A/E VLF1495:B VLF1497:C/D
10 8 7 6
1 2 3 4 5

L0701 0.27u:A/C/D/E 0.22u:B

(C/D) X0702 VLF1431

X0701 VLF1416:A/E VLF1417:B VLF1430:C/D

K7501 56P (A/E)

C0710 0.01

L0703 2.2u:A/C/D/E 1.8u:B

R0725 100

C0715 3P: A/C/D/E 12P:B

PP0701 (TO TUNER UNIT)

4MHz	1
AGC	2
IF	3
GND	4

C0711 16V22

R0715 22K

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
TV DEMODULATOR PACK SCHEMATIC DIAGRAM

F E D C B A

1 2 3 4 5 6 7 8

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓐ :TO HI-FI AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓓ :TO DECODER SECTION

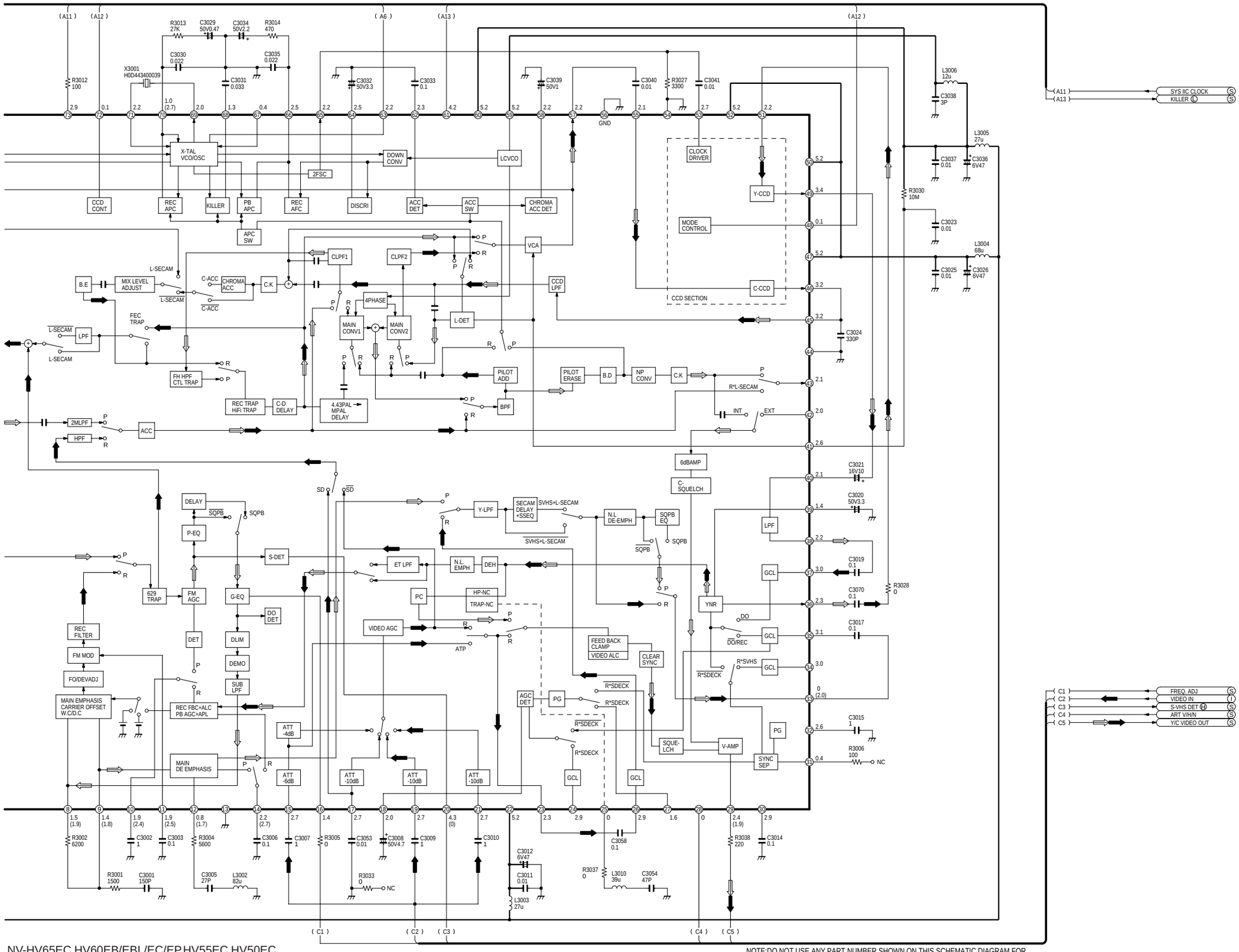
VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

P4002 (TO A/C HEAD)
AUDIO ERASE IN 1
GND 2
AUDIO HEAD (R) 3
AUDIO HEAD (W) 4
CTL HEAD (-) 5
CTL HEAD (+) 6

P4001 (TO FULL ERASE HEAD)
FULL ERASE OUT 1
FULL ERASE IN 2

P5001 (TO CYLINDER UNIT)
LP/EP R 1
LP/EP COM 2
LP/EP L 3
SP R 4
SP COM 5
SP L 6
GND (HA) 7
AUDIO HEAD L 8
AUDIO HEAD COM 9
AUDIO HEAD R 10

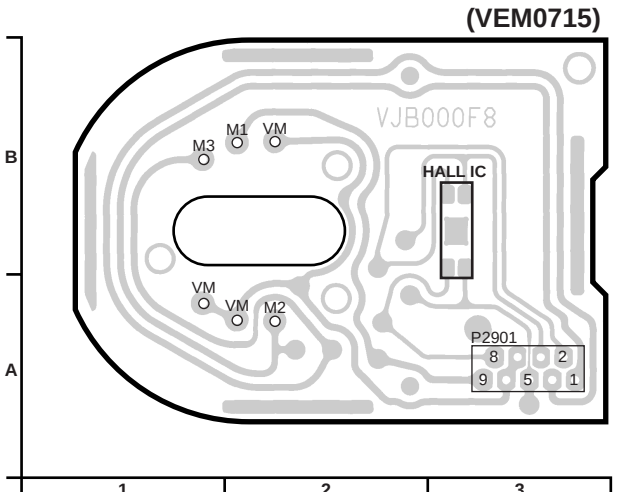
Q3001 2SD601A (AMP)
Q4001 UN2211 (PAL EP Ⓗ:ON)
QR4001 UN2211 (PAL EP Ⓗ:ON)
Q4002 UN2111 (D.A.REC Ⓗ:OFF)
Q4003 2SD114900L (PB:ON)
Q4004 2SD601A (PB:ON)
Q4005 2SD602A (OSC)
QR4005 UN2212 (BIAS Ⓗ:ON)
Q4006 2SB710A (ERASE HEAD DRIVE)
T4001 EQQ7QF024P
IC3001 HA118425F
TW3001



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
LUMINANCE & CHROMINANCE/AUDIO SECTION SCHEMATIC DIAGRAM

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
LUMINANCE & CHROMINANCE/AUDIO
SECTION SCHEMATIC DIAGRAM

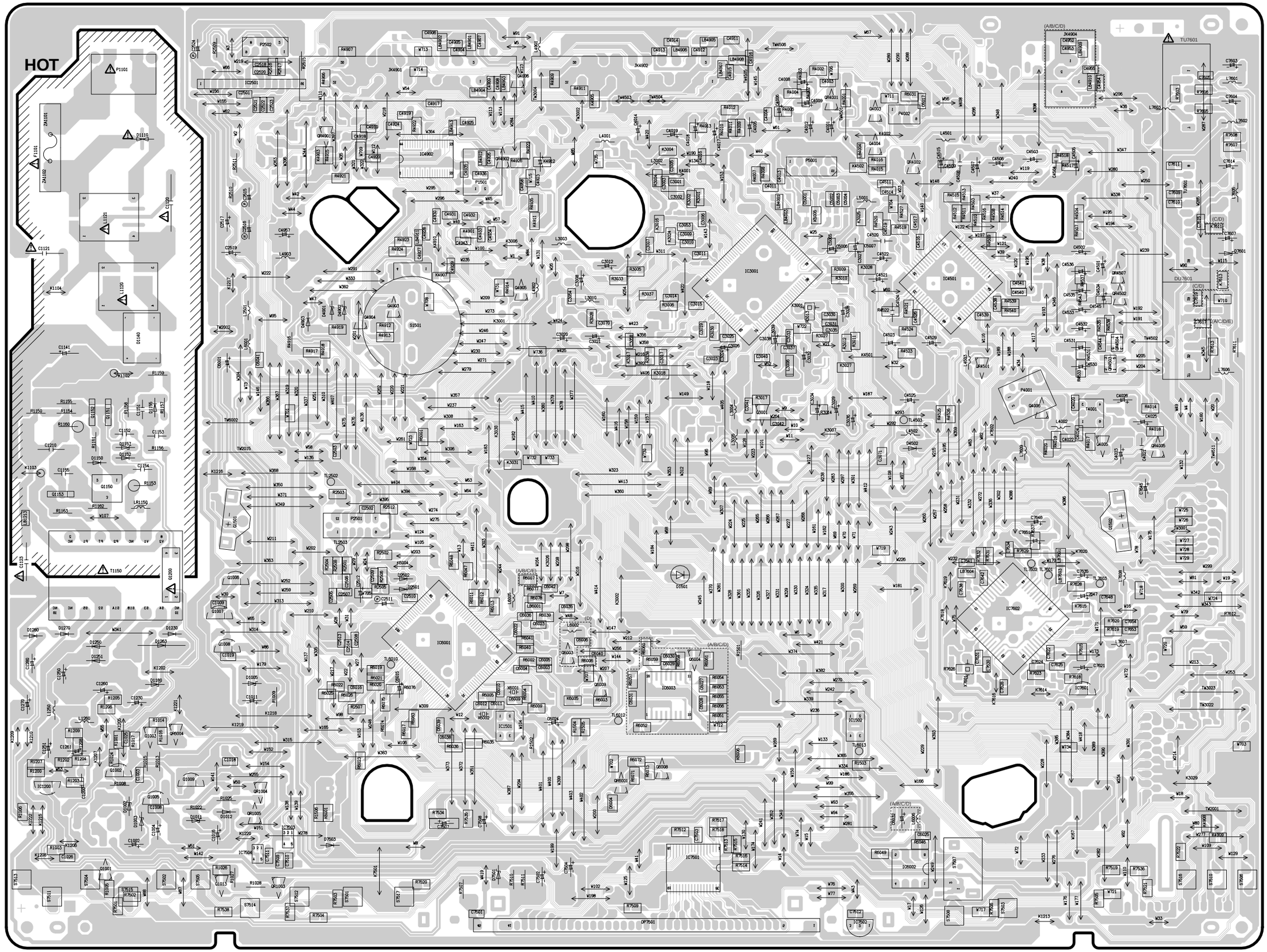


CYLINDER STATOR UNIT	
Integrated Circuit	
HALL IC	B-3
Connector	
P2901	A-3

ADDRESS INFORMATION

NV-HV65EC,HV60EB/EBL/EC/EP,
HV55EC,HV50EC
CYLINDER STATOR UNIT

(VEP06F09G: NV-HV65EC, HV60EC, HV55EC) (VEP06F09H: NV-HV60EB) (VEP06F09J: NV-HV60EBL) (VEP06F09L: NV-HV60EP) (VEP06F09N: NV-HV50EC)



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC MAIN C.B.A.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SAME TYPE.

CAUTION

THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

MAIN C.B.A.

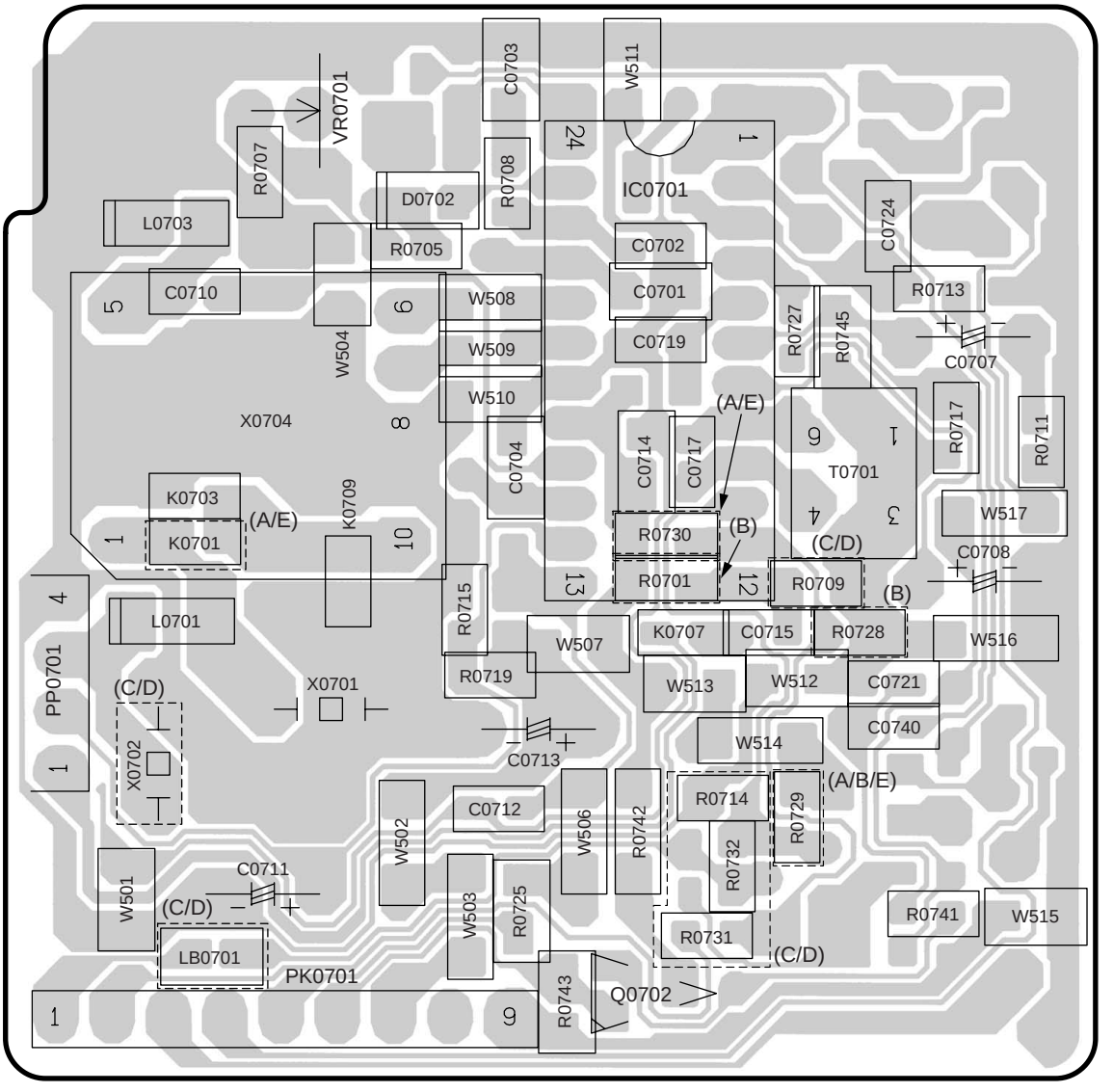
Transistor		**Integrated Circuit**	
Q1001	A-1	IC1200	B-1
Q1002	B-1	IC1501	B-4
Q1003	B-2	IC1502	B-6
Q1005	B-2	IC2501	F-2
Q1006	C-2	IC3001	E-5
Q1007	C-2	IC4501	E-7
Q1008	C-2	IC4902	F-3
Q1009	B-2	IC6001	C-3
Q1013	A-2	IC6002	A-6
Q1150	D-1	IC6003	B-5
Q1151	D-1	IC7501	A-5
Q1152	D-1	IC7502	A-6
Q1153	C-1	IC7503	A-3
Q1200	C-2	IC7504	A-2
Q1501	C-2	IC7601	B-7
Q1502	C-8	IC7602	C-7
Q3001	D-5	**Test Point**	
Q4003	F-6	TL2502	D-3
Q4004	F-6	TL2503	C-3
Q4005	D-8	TL4503	D-6
Q4006	D-7	TL6010	B-3
Q4903	E-3	TL6012	B-5
Q4904	E-3	TL6013	B-6
Q4905	E-4	TL7601	C-7
Q4906	F-4	TL7602	C-7
Q6003	B-4	TL7603	C-8
Q6004	B-5	TW2001	A-8
Q6008	B-5	TW2002	D-2
Q6009	B-4	TW2015	D-2
Transistor & Resistor		TW3001	C-8
QR1003	A-2	TW3002	F-4
QR1004	B-2	TW3004	F-4
QR1005	A-2	TW3022	B-8
QR4001	F-6	TW3023	B-8
QR4002	F-6	TW4501	F-6
QR4005	D-8	TW4502	D-8
QR4501	D-7	TW4503	F-5
QR4502	E-8	TW4504	F-5
QR4503	D-8	TW4505	F-5
QR4504	D-8	TW4506	F-6
QR4507	E-8	TW4511	D-8
QR4901	F-3	TW6002	D-2
QR4902	F-4	**Connector**	
QR6001	B-5	P1101	F-1
QR6004	B-2	P1501	E-4
		P2501	C-3
		P2502	F-2
		P4001	D-7
		P4002	F-6
		P5001	F-6
		TU7601	F-8

ADDRESS INFORMATION

TV DEMODULATOR PACK C.B.A.	
Transistor	
Q0702	A-3
Integrated Circuit	
IC0701	D-3
Adjustment	
T0701	C-4
VR0701	D-2
Connector	
PK0701	A-2
PP0701	B-1

ADDRESS INFORMATION

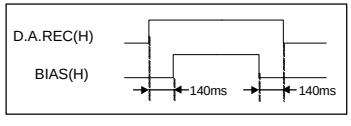
(VEP07A23S:NV-HV65EC,HV60EC,HV55EC,HV50EC)
(VEP07A23T:NV-HV60EB)
(VEP07A23U:NV-HV60EBL/EP)

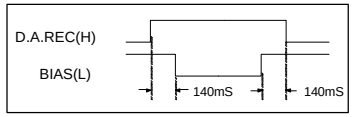


NV-HV65EC,HV60EB/EBL/EC/EP,
HV55EC,HV50EC
TV DEMODURATOR PACK C.B.A.

Pin No.	Signal Name	I/O	Describe	P-OFF	P-SAVE	P-FAIL	Reset
1	A.DEF(H)	O	Output signal for audio defea and decoder IC reset.	Low	Low	Low	Low
2	CKILLER DET(L)	I	Detection of COLOR KILLER active.	In	In	In	In
3	AFC S	I	S curve input from tuner.	In	In	In	In
4	SLP(H)	O	Output signal depens on tape speed. (During N10H or P9H: High) (Except N10H and P9H: Low)	Low	Low	Low	Low
5	CPB	I	PB input from AV2. *3.21v ~ :High *1.23v ~ 3.21v :Middle * ~ 1.23v : Low	In	In	In	In
6	N/S/T2	I	Normal/Service/Test2/Test3 select. * 4.0v ~ :NORMAL mode * 2.5v ~ 4.0v :SERVICE mode * 1.0v ~ 2.5v :TEST2 mode * 0v ~ 1.0v :No define (spare)	In	In	In	In
7	S-PHOTO	I	Photo sensor input from supply side. (more than 2.6V: black / less than 2.4V: white)	In	In	In	In
8	T-PHOTO	I	Photo sensor input from take up side. (more than 2.6V: black / less than 2.4V: white)	In	In	In	In
9	TRACKING_ENVE	I	Video envelope input for auto tracking and CVC.	In	In	In	In
10	AV1_8IN	I	PB input from IC3001. * 3.21v ~ : High * 1.23v ~ 3.21v: Middle * ~ 1.23v: Low	In	In	In	In
11	CURRENT_LIMIT	O	Current limit for capstan driver.	Low	Low	Low	Low
12	F ADJUST	O	Analogue voltage output for HEAD frequency response adjustment.	Low	Low	Low	Low
13	ART.V/H/N	O	Artificial V synchronization signal.	Low	Low	Low	Low
14	IR	I	Interrupt input from IR sensor.	In	In	In	In
15	AVPB-H(L)	O	Output signal for AV2-PB "H". (2 Scart Model) Output signal for AV1-PB "H". (1 Scart Model) * H/M/L is output to 21pin-(8) when both terminals are set as follows.	High	High	Low	High
16	AVPB-M(H)	O		Low	Low	Low	Low
17	EEP_WR	O	Write enable for EEPROM. *H:READ only L:Write	High	High	Low	High
18	VIDEO.H.SW	O	Output signal for video HEAD switch.	Low	Low	Low	Low
19	A.H.SW	O	Output signal for FM audio HEAD switch.	Low	Low	Low	Low
20	PROG ON(H)	O	I/O control to switch IIC bus for LW-programmer. H:IIC bus is connected to AV2. L:IIC bus is not connected to AV2.	Low	Low	Low	Low
21	B/W(H)	O	Output signal for B/W mode.	Low	Low	Low	Low
22	NC	O	Non connect. (Low Fix)	Low	Low	Low	Low
23	ABS_NORM(H)	I	Input signal for FM audio enverope level detection. (Also serves that the Automatic Adjustment is completed)	In	In	In	In
24	V EE(L)	O	Output signal for switch between EE and VV.	Low	Low	Low	Low
25	D.FM.REC(H)	O	Control signal for FM audio recording current)	Low	Low	Low	Low
26	D.A.REC(H)	O	Control signal for normal audio recording current.	Low	Low	Low	Low
27	BIAS(H)	O	Control signal for FM audio recording current.	Low	Low	Low	Low
28	FM.MUTE(H)	O	Output signal for audio mute control.	High	High	Low	High
29	PAL-I/BG/DK(SYS4)	O	Output terminal for broad cast system to control the video circuit.	Not fix	Low	Low	Low
30	S-VHS DET(H)	I	Detection between SVHS and VHS.	In	In	In	In

Pin 8	Setting	
	AVPB-H(L)	AVPBM-(H)
High	L	Hi-z
Middle	H	Hi-z
Low	H	L



Pin No.	Signal Name	I/O	Describe	P-OFF	P-SAVE	P-FAIL	Reset
31	POS.SW3	I	Input terminal for mechanism position. 	In	In	In	In
32	POS.SW2	I		In	In	In	In
33	POS.SW1	I		In	In	In	In
34	RESET(L)	I	MICOM reset input terminal.	In	In	In	In
35	32KHz IN	I	Sub oscillator input.	---	---	---	---
36	32KHz OUT	O	Sub oscillator output.	---	---	---	---
37	+5V(D)	-	Power.	---	---	---	---
38	12MHz.IN	I	Main oscillator input.	---	---	---	---
39	12MHz.OUT	O	Main oscillator output.	---	---	---	---
40	GND(D)	-		---	---	---	---
41	POWER OFF(L)	O	Control signal for power circuit. *Low is existed when turning off the power supply for concerned circuit. *High is existed while power is supplied to mechanism and/or concerned circuit, although it seems to be power off.	Low	Low	Low	Low
42	FIP ON(L)	O	Control signal for FIP on/off. P-OFF in power save mode: "H" is output. Other than above: "L" is output. (Output switching timing of FIP"L" is same with the switching timing of POWER OFF "L".)	Low	High	Low	Low
43	12M.START(H)	I	Starting clock select terminal at releasing RESET.	---	---	---	---
44	LC.OSC IN	I	OSC terminal for OSD dot clock.	---	---	---	---
45	LC.OSC OUT	O	OSC terminal for OSD dot clock.	---	---	---	---
46	GND	I	GND	---	---	---	---
47	4FC.LPF	I	NC	---	---	---	---
48	OSD.FSC IN	I	NC	---	---	---	---
49	GND(OSD)	-	GND	---	---	---	---
50	CVIN	I	Composite video signal input terminal.	---	---	---	---
51	LECHA	I	Composite video signal white level input terminal.	---	---	---	---
52	CVOUT	O	CG video output teminal.	---	---	---	---
53	5V(OSD)	-		---	---	---	---
54	HLF	I	LPF connection terminal for SLICER (Used for OSD dot clock.)	---	---	---	---
55	AMUTE(H)	O	Audio mute signal only for RF convertor.	High	High	Low	High
56	CVIN(EDS)	I	Composite video signal input terminal for SLICER.	In	In	In	In
57	GND	I		---	---	---	---
58	SECAM/PAL(SYS2)	O	Output terminal for the unit recognition result of broad cast system.	Low	Low	Low	Low
59	SECAM.V.IN	I	Chroma input terminal for SECAM SUPERIMPOSE.	---	---	---	---
60	OSD PULSE	O	Abstraction signal for BOX from the video signal at SUPERIMPOSE.	Low	Low	Low	Low
61	SLEEP(L)	O	Power circuit control signal for super power save mode. *P-OFF in power save mode: "L" is output. Other than above: "H" is output. *Output switching timing of FIP "L" is same with the switching timing of POWER OFF "L".)	High	Low	Low	High
62	UNLOADING(H)	O	Control signal for Loading motor forward. *High is existed when the loading motor rotates reverse direction and/or breaking.	Low	Low	Low	Low
63	LOADING(H)	O	Control signal for Loading motor reverse. *High is existed when the loading motor rotates forward direction and/or breaking.	Low	Low	Low	Low
64	FLD CS	O	FLD chip select terminal.	Not fix	Not fix	Low	Low
65	MESECAM DET(H)	I	Detection between MESECAM and NORMAL in playback mode.	In	In	In	In
66	LP(H)	O	Output signal depens on tape speed in both EE and VV modes. * During N4H,N6H,P6H or P9H: High. * Other than above speed: Low.	Low	Low	Low	Low
67	NC	O	Non connect. * Low fixed.	Low	Low	Low	Low
68	FLD DATA OUT	O	Serial data output signal for FIP driver.	Not fix	Not fix	Low	Low
69	FLD DATA IN	I	Serial data input signal for FIP driver.	Not fix	Not fix	In	In
70	FLD CLK	O	Serial clock signal for FIP driver.	Not fix	Not fix	Low	Low
71	IIC CLK	O	IIC clock for all IIC devices	Not fix	Not fix	Low	Low
72	IIC DATA	O	IIC data for all IIC devices	Not fix	Not fix	Low	Low
73	125Hz	O	125Hz output for adjustment of clock accuracy . (Output in only TEST MODE 2.)	Low	Low	Low	Low
74	CAP.R/F	O	Control signal for capstan motor diriction.	Low	Low	Low	Low

Pin No.	Signal Name	I/O	Describe	P-OFF	P-SAVE	P-FAIL	Reset
75	HALF_WAVE(H)	O	Control signal for switching capstan motor mode FAST and SLOW.	In	In	In	In
76	CAP.ET	O	Torque control signal for capstan motor.	0V	0V	Low	0V
77	CYL.ET	O	Torque control signal for cylinder motor.	4.213V	4.213V	Low	4.213V
78	P FAIL	I	Interrupt input signal for power fail detection.	In	In	In	In
79	S.REEL.PULSE	I	Input signal from supply reel sensor.	In	In	In	In
80	T.REEL.PULSE	I	Input signal from take up reel sensor.	In	In	In	In
81	S TAB(L)	I	Input signal from Safety-tab SW. * Safety-tab exists: Low, * Safety-tab does not exist: High)	In	In	In	In
82	POWER_KEY	I	Input terminal for signal from power button on the Front Panel. * Switch between ON and off, when down edge is detected.	In	In	In	In
83	CNR OFF(H)	O	CNR control for IC3001.	Low	Low	Low	Low
84	SECAM_ID(L)	I	Detection of SECAM mode.	In	In	In	In
85	DAVN	I	DAVN signal from Slicer	In	In	In	In
86	FG.AMP.OUT	I	Output from internal FG Amplifier	---	---	---	---
87	FG.AMP.IN	I	Input for internal FG Amplifier	---	---	---	---
88	GND(A)	-		---	---	---	---
89	AV3_S_IN(L)	I	Detection of conposite or conponent for AV3 VIDEO INPUT.	In	In	In	In
90	PFG	I	FPG input terminal.	---	---	---	---
91	OREF	O	Output from internal reference voltage (2.5V)	---	---	---	---
92	IREF	I	Input for internal reference voltage	---	---	---	---
93	SCAS_IN(L)	I	Detection between VHS tape or S-VHS tape.	In	In	In	In
94	CTL.HEAD(-)	I/O	Input signal from CTL HEAD(+)	---	---	---	---
95	CTL.HEAD(+)	I/O	Input signal from CTL HEAD(-)	---	---	---	---
96	CTL.AMP.REF	I	Input for internal CTL amplifier reference voltage	---	---	---	---
97	PB.CTL.OUT	O	Output from internal CLT amplifier	---	---	---	---
98	+5V(A)	-		---	---	---	---
99	+5V(AD)	-		---	---	---	---
100	EX.FF/REW(L)	O	Control terminal for the filter of the PB-CTL signal during FF/REW.	Low	Low	Low	Low

INPUT CONDITION								OUTPUT RESULT							
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 OUT	AV1 S(H)	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
OFF	---	---	---	---	---	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
EXT LINK 1/2 Standby	---	---	---	L	NO.TU	L/M/H	---	MUTE	L	MUTE	*1[L(0)]	L	OFF(1)	TUN(000)	TUN
					C+.TU	L/M/H	---	MUTE	L	MUTE	*1[L(0)]	L	OFF(1)	TUN(000)	TUN
					AV1	L/M/H	---	MUTE	L	MUTE	*1[L(0)]	L	OFF(1)	AV1(100)	AV1
					AV2	L/M/H	---	MUTE	L	MUTE	*1[L(0)]	L	OFF(1)	AV2(010)	AV2
					AV3	L/M/H	---	MUTE	L	MUTE	*1[L(0)]	L	OFF(1)	AV3(110)	AV3
				H	no chance		---	---	---	---	---	---	---	---	---
VPS STAND BY	EXT	---	---	L	NO.TU	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
					C+.TU	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
					AV1	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV1(100)	AV1
					AV2	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
					AV3	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV3(110)	AV3
				H	NO.TU	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	TUN(000)	TUN
							S-VIDEO		H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO		H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	TUN(000)	TUN
							S-VIDEO		H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO		H						
					AV1	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	AV1(100)	AV1
							S-VIDEO		H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO		H						
					AV2	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	AV2(010)	AV2
							S-VIDEO		H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO		H						
					AV3	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	AV3(110)	AV3
							S-VIDEO		H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO		H						
	DECODER	---	---	L	NO.TU	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
					C+.TU	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
					AV1	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
					AV2	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
					AV3	L	---	AV2 IN(0)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
						M/H	---	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV3(110)	AV3
				H	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						

INPUT CONDITION								OUTPUT RESULT							
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 OUT	AV1 S(H)	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
P.ON	EXT	TV	EE	L	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	L(0)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	L(0)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
	or				AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	L(0)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
					AV2	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	L(0)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
	"DECODER				AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	L(0)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
	and			H	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
	EXTLINK1/2				C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
	Standby				AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
	is ON"				AV2	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
		VTR	EE	L	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	H	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
				H	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
					AV2	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
			VV	L	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
					C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
					AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV1(100)	PB
							S-VIDEO	Y OUT(11)	H						
					AV2	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
					AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV3(110)	PB
							S-VIDEO	Y OUT(11)	H						
				H	NO.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
					C+.TU	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
					AV1	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	PB
							S-VIDEO	Y OUT(11)	H						
					AV2	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
					AV3	---	VIDEO	VCR OUT(1)	L	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	PB
							S-VIDEO	Y OUT(11)	H						

INPUT CONDITION								OUTPUT RESULT							
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 OUT	AV1 S(H)	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
P.ON	DECODER	TV	EE	L	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
							S-VIDEO	AV2 IN(0)	L						
					C+.TU	L	VIDEO	VCR OUT(1)	L	TUN IN(10)	L(0)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	TUN IN(10)	L(0)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
							S-VIDEO	AV2 IN(0)	L						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
							S-VIDEO	AV2 IN(0)	L						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	AV2 IN(0)	L	AV1 IN(00)	M/H(1)	L	*4	AV3(110)	AV3
							S-VIDEO	AV2 IN(0)	L						
				H	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	TUN IN(10)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	TUN IN(10)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
		VTR	EE	L	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	TUN IN(10)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	TUN IN(10)	M/H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						

INPUT CONDITION								OUTPUT RESULT							
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 OUT	AV1 S(H)	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
P.ON	DECODER	VTR	EE	H	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	TUN IN(10)	H(1)	L	OFF(1)	TUN(000)	TUN
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	TUN IN(10)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
							S-VIDEO	Y OUT(11)	H						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
							S-VIDEO	Y OUT(11)	H						
			VV	---	NO.TU	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
					C+.TU	L	VIDEO	VCR OUT(1)	L	TUN IN(10)	M/H(1)	L	OFF(1)	TUN(000)	PB
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	TUN IN(10)	M/H(1)	L	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
					AV1	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV1(100)	PB
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
					AV2	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
							S-VIDEO	Y OUT(11)	H						
					AV3	L	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV3(110)	PB
							S-VIDEO	Y OUT(11)	H						
						M/H	VIDEO	VCR OUT(1)	L	AV1 IN(00)	M/H(1)	L	OFF(1)	AV3(110)	PB
							S-VIDEO	Y OUT(11)	H						

INPUT CONDITION								Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
OFF	---	---	---	---	---	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
EXT LINK 1/2 Standby	---	---	---	L	NO.TU	L/M/H	---	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					C+.TU	L/M/H	---	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					AV1	L/M/H	---	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					AV2	L/M/H	---	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					AV3	L/M/H	---	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				H	no chance		---	---	---	---	---	---	---	---	---	---	---
VPS STAND BY	EXT	---	---	L	NO.TU	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					C+.TU	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV1	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV2	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV3	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				H	NO.TU	L	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
					C+.TU	L	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
					AV1	L	VIDEO	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
							S-VIDEO										
					AV2	L	VIDEO	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
							S-VIDEO										
					AV3	L	VIDEO	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
							S-VIDEO										
	DECODER	---	---	L	NO.TU	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					C+.TU	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV1	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV2	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					AV3	L	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
						M/H	---	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				H	NO.TU	L	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
					C+.TU	L	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
							S-VIDEO										
					AV1	L	VIDEO	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
							S-VIDEO										
					AV2	L	VIDEO	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
							S-VIDEO										
					AV3	L	VIDEO	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
							S-VIDEO										
						M/H	VIDEO	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
							S-VIDEO										

INPUT CONDITION								Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
P.ON	EXT	TV	EE	L	NO.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
					C+.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
	or				AV1	---	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
							S-VIDEO										
					AV2	---	VIDEO	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
							S-VIDEO										
	"DECODER				AV3	---	VIDEO	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
							S-VIDEO										
	and			H	NO.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
	EXTLINK1/2				C+.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
	Standby				AV1	---	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
							S-VIDEO										
	is ON"				AV2	---	VIDEO	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
							S-VIDEO										
					AV3	---	VIDEO	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
							S-VIDEO										
		VTR	EE	L	NO.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
					C+.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
					AV1	---	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
							S-VIDEO										
					AV2	L	VIDEO	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
							S-VIDEO										
					AV3	---	VIDEO	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
							S-VIDEO										
				H	NO.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
					C+.TU	---	VIDEO	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
							S-VIDEO										
					AV1	---	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
							S-VIDEO										
					AV2	---	VIDEO	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
							S-VIDEO										
					AV3	---	VIDEO	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
							S-VIDEO										
			VV	L	NO.TU	---	VIDEO	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
							S-VIDEO										
					C+.TU	---	VIDEO	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
							S-VIDEO										
					AV1	---	VIDEO	PB	PB	PB	AV1IN	INSEL	PB	EXT1	OUTSEL	L	L
							S-VIDEO										
					AV2	---	VIDEO	PB	PB	PB	AV2IN	INSEL	PB	EXT2	OUTSEL	L	L
							S-VIDEO										
					AV3	---	VIDEO	PB	PB	PB	AV3IN	INSEL	PB	EXT3	OUTSEL	L	L
							S-VIDEO										
				H	NO.TU	---	VIDEO	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
							S-VIDEO										
					C+.TU	---	VIDEO	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
							S-VIDEO										
					AV1	---	VIDEO	PB	PB	PB	AV1IN	INSEL	PB	EXT1	OUTSEL	L	L
							S-VIDEO										
					AV2	---	VIDEO	PB	PB	PB	AV2IN	INSEL	PB	EXT2	OUTSEL	L	L
							S-VIDEO										
					AV3	---	VIDEO	PB	PB	PB	AV3IN	INSEL	PB	EXT3	OUTSEL	L	L
							S-VIDEO										

INPUT CONDITION								Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
P.ON	DECODER	TV	EE	L	NO.TU	L	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	TUN --> A2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					C+.TU	L	VIDEO	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
							S-VIDEO										
					AV1	L	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV2	L	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV3	L	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV3IN --> A2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
				H	NO.TU	L	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
					C+.TU	L	VIDEO	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
							S-VIDEO										
					AV1	L	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV2	L	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV3	L	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
		VTR	EE	L	NO.TU	L	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
					C+.TU	L	VIDEO	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
							S-VIDEO										
					AV1	L	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV2	L	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV3	L	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										

INPUT CONDITION								Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	TV/ VTR	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
P.ON	DECODER	VTR	EE	H	NO.TU	L	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	TUN	AV1IN	TUN	TUN	AV1IN	REC	TV	EXT1	L	L
							S-VIDEO										
					C+.TU	L	VIDEO	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
							S-VIDEO										
					AV1	L	VIDEO	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV2	L	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
							S-VIDEO										
					AV3	L	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
							S-VIDEO										
			VV	---	NO.TU	L	VIDEO	PB	AV1IN	PB	TUN	AV1IN	PB	TV	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	PB	AV1IN	PB	TUN	AV1IN	PB	TV	EXT1	L	L
							S-VIDEO										
					C+.TU	L	VIDEO	PB	TUN	PB	TUN	TUN	PB	TV	TVIN	L	L
							S-VIDEO										
						M/H	VIDEO	PB	TUN	PB	AV2IN	TUN	PB	EXT2	TVIN	L	L
							S-VIDEO										
					AV1	L	VIDEO	PB	AV1IN	PB	AV1IN	AV1IN	PB	EXT1	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
							S-VIDEO										
					AV2	L	VIDEO	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
							S-VIDEO										
					AV3	L	VIDEO	PB	AV1IN	PB	AV3IN	AV1IN	PB	EXT3	EXT1	L	L
							S-VIDEO										
						M/H	VIDEO	PB	AV1IN	PB	AV3IN	AV1IN	PB	EXT3	EXT1	L	L
							S-VIDEO										

Remark:

NO.TU	Tuner position, DECODER OFF (e.g. ARD)
C+TU	Tuner position, DECODER ON (e.g. PREMI)
RGW SW	OFF = HIGH
RGW SW	ON = LOW
EE	Non-Playback signal
VV	Playback signal
INSEL	Inputselect= Audio Output signal from AN3655 at Line Out
***1[L(0)]**	**In case of EXT LINK1 standby(not EXT LINK2), AV1 PB must not output 'M' or 'H'**
***2[H*] / *3[M/H]**	**AV2 PB must not output 'M' or 'H' if AV2 PB IN is 'M' or 'H'.**
***4**	**RGB SW output "ON" if AV1PB is "H" or "M". (RGB SW output "OFF" if AV1PB is "L")**

INPUT CONDITION						OUTPUT RESULT						
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
OFF	---	---	---	---	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
EXT LINK 1/2 Standby	---	---	L	TUN	L/M/H	MUTE	MUTE	*1[L(0)]	L	OFF(1)	TUN(000)	TUN
				AV1	L/M/H	MUTE	MUTE	*1[L(0)]	L	OFF(1)	AV1(100)	AV1
				AV2	L/M/H	MUTE	MUTE	*1[L(0)]	L	OFF(1)	AV2(010)	AV2
				AV3	L/M/H	MUTE	MUTE	*1[L(0)]	L	OFF(1)	AV3(110)	AV3
			H	no chance		---	---	---	---	---	---	---
PDC STAND BY	EXT	---	L	TUN	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
				AV1	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV1(100)	AV1
				AV2	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
				AV3	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV3(110)	AV3
			H	TUN	L	VCR OUT(1)	VCR OUT(11)	H(1)	H	OFF(1)	TUN(000)	TUN
					M/H	VCR OUT(1)	VCR OUT(11)	H(1)	L	OFF(1)	TUN(000)	TUN
				AV1	L	VCR OUT(1)	VCR OUT(11)	H(1)	H	OFF(1)	AV1(100)	AV1
					M/H	VCR OUT(1)	VCR OUT(11)	H(1)	L	OFF(1)	AV1(100)	AV1
				AV2	L	VCR OUT(1)	VCR OUT(11)	H(1)	H	OFF(1)	AV2(010)	AV2
					M/H	VCR OUT(1)	VCR OUT(11)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV3	L	VCR OUT(1)	VCR OUT(11)	H(1)	H	OFF(1)	AV3(110)	AV3
					M/H	VCR OUT(1)	VCR OUT(11)	H(1)	L	OFF(1)	AV3(110)	AV3
	DECODER	---	L	TUN	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	TUN(000)	TUN
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	TUN(000)	TUN
				AV1	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
				AV2	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV2(010)	AV2
				AV3	L	AV2 IN(0)	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
					M/H	AV2 IN(0)	AV1 IN(00)	M/H(1)	L	*4	AV3(110)	AV3
			H	TUN	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	TUN(000)	TUN
				AV1	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV2	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV3	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3

INPUT CONDITION						OUTPUT RESULT						
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 OUT	AV2 OUT	AV1 PB(H)	AV2 PB(H)	RGB SW	VCR IN	VCR OUT
P.ON	EXT	EE	L	TUN	---	VCR OUT(1)	VCR OUT(11)	L(0)	L	OFF(1)	TUN(000)	TUN
				AV1	---	VCR OUT(1)	VCR OUT(11)	L(0)	L	OFF(1)	AV1(100)	AV1
	or			AV2	---	VCR OUT(1)	VCR OUT(11)	L(0)	L	OFF(1)	AV2(010)	AV2
				AV3	---	VCR OUT(1)	VCR OUT(11)	L(0)	L	OFF(1)	AV3(110)	AV3
	"DECODER		H	TUN	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	TUN
	and			AV1	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	AV1
	EXTLINK1/2			AV2	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV2(010)	AV2
	Standby			AV3	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	AV3
	is ON"	VV	L	TUN	---	VCR OUT(1)	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	TUN(000)	PB
				AV1	---	VCR OUT(1)	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV1(100)	PB
				AV2	---	VCR OUT(1)	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV2(010)	PB
				AV3	---	VCR OUT(1)	VCR OUT(11)	M/H(1)	*3[M/H]	OFF(1)	AV3(110)	PB
			H	NO.TU	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	PB
				C+.TU	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	TUN(000)	PB
				AV1	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV1(100)	PB
				AV2	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV2(010)	PB
				AV3	---	VCR OUT(1)	VCR OUT(11)	H(1)	*2[H]	OFF(1)	AV3(110)	PB
	DECODER	EE	L	TUN	L	VCR OUT(1)	TUN IN(10)	L(0)	L	OFF(1)	TUN(000)	TUN
					M/H	VCR OUT(1)	TUN IN(10)	L(0)	L	OFF(1)	AV2(010)	AV2
				AV1	L	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV1(100)	AV1
					M/H	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
				AV2	L	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
					M/H	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV2(010)	AV2
				AV3	L	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
					M/H	VCR OUT(1)	AV1 IN(00)	L(0)	L	OFF(1)	AV3(110)	AV3
			H	TUN	L	VCR OUT(1)	TUN IN(10)	H(1)	L	OFF(1)	TUN(000)	TUN
					M/H	VCR OUT(1)	TUN IN(10)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV1	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV1(100)	AV1
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV2	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV2(010)	AV2
				AV3	L	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
					M/H	VCR OUT(1)	AV1 IN(00)	H(1)	L	OFF(1)	AV3(110)	AV3
		VV	---	TUN	L	VCR OUT(1)	TUN IN(10)	M/H(1)	L	OFF(1)	TUN(000)	PB
					M/H	VCR OUT(1)	TUN IN(10)	M/H(1)	L	OFF(1)	AV2(010)	PB
				AV1	L	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV1(100)	PB
					M/H	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
				AV2	L	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
					M/H	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV2(010)	PB
				AV3	L	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV3(110)	PB
					M/H	VCR OUT(1)	AV1 IN(00)	M/H(1)	L	OFF(1)	AV3(110)	PB

INPUT CONDITION						Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
OFF	---	---	---	---	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
EXT LINK 1/2 Standby	---	---	L	TUN	L/M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV1	L/M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV2	L/M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV3	L/M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
			H	no chance		---	---	---	---	---	---	---	---	---	---
PDC STAND BY	EXT	---	L	TUN	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV1	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV2	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV3	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
			H	TUN	L	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
					M/H	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
				AV1	L	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
					M/H	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
				AV2	L	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV3	L	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
					M/H	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
	DECODER	---	L	TUN	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV1	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV2	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
				AV3	L	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
					M/H	AV2IN	AV1IN	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	L	H
			H	TUN	L	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
					M/H	Mute	Mute	Mute	TUN	AV1IN	REC	TV	EXT1	H	H
				AV1	L	Mute	Mute	Mute	AV1IN	AV1IN	REC	EXT1	EXT1	H	H
					M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV2	L	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
					M/H	Mute	Mute	Mute	AV2IN	AV1IN	REC	EXT2	EXT1	H	H
				AV3	L	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H
					M/H	Mute	Mute	Mute	AV3IN	AV1IN	REC	EXT3	EXT1	H	H

INPUT CONDITION						Audio Output Results					IC4501 settings			Mute signals	
POWER	AV2 SELECT	EE/ VV	OSD ON(H)	INPUT CH	AV2 PB(H)	AV1 Out	AV2 Out	RF (C)	AV1 Out Selector	AV2 Out Selector	REC/ PB	Input Select	Dec Select	Mute (H)	A-Mute (H)
P.ON	EXT	EE	L	TUN	---	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
				AV1	---	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
	or			AV2	---	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
				AV3	---	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
	"DECODER		H	TUN	---	TUN	TUN	TUN	TUN	INSEL	REC	TV	OUTSEL	L	L
	and			AV1	---	AV1IN	AV1IN	AV1IN	AV1IN	INSEL	REC	EXT1	OUTSEL	L	L
	EXTLINK1/2			AV2	---	AV2IN	AV2IN	AV2IN	AV2IN	INSEL	REC	EXT2	OUTSEL	L	L
	Standby			AV3	---	AV3IN	AV3IN	AV3IN	AV3IN	INSEL	REC	EXT3	OUTSEL	L	L
	is ON"	VV	L	TUN	---	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
				AV1	---	PB	PB	PB	AV1IN	INSEL	PB	EXT1	OUTSEL	L	L
				AV2	---	PB	PB	PB	AV2IN	INSEL	PB	EXT2	OUTSEL	L	L
				AV3	---	PB	PB	PB	AV3IN	INSEL	PB	EXT3	OUTSEL	L	L
			H	NO.TU	---	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
				C+.TU	---	PB	PB	PB	TUN	INSEL	PB	TV	OUTSEL	L	L
				AV1	---	PB	PB	PB	AV1IN	INSEL	PB	EXT1	OUTSEL	L	L
				AV2	---	PB	PB	PB	AV2IN	INSEL	PB	EXT2	OUTSEL	L	L
				AV3	---	PB	PB	PB	AV3IN	INSEL	PB	EXT3	OUTSEL	L	L
	DECODER	EE	L	TUN	L	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
					M/H	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
				AV1	L	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
					M/H	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
				AV2	L	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
					M/H	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
				AV3	L	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
					M/H	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
			H	TUN	L	TUN	TUN	TUN	TUN	TUN	REC	TV	TVIN	L	L
					M/H	AV2IN	TUN	AV2IN	AV2IN	TUN	REC	EXT2	TVIN	L	L
				AV1	L	AV1IN	AV1IN	AV1IN	AV1IN	AV1IN	REC	EXT1	EXT1	L	L
					M/H	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
				AV2	L	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
					M/H	AV2IN	AV1IN	AV2IN	AV2IN	AV1IN	REC	EXT2	EXT1	L	L
				AV3	L	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
					M/H	AV3IN	AV1IN	AV3IN	AV3IN	AV1IN	REC	EXT3	EXT1	L	L
		VV	---	TUN	L	PB	TUN --> mute	PB	TUN	TUN	PB	TV	TVIN	L	L
					M/H	PB	TUN --> mute	PB	AV2IN	TUN	PB	EXT2	TVIN	L	L
				AV1	L	PB	AV1IN	PB	AV1IN	AV1IN	PB	EXT1	EXT1	L	L
					M/H	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
				AV2	L	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
					M/H	PB	AV1IN	PB	AV2IN	AV1IN	PB	EXT2	EXT1	L	L
				AV3	L	PB	AV1IN	PB	AV3IN	AV1IN	PB	EXT3	EXT1	L	L
					M/H	PB	AV1IN	PB	AV3IN	AV1IN	PB	EXT3	EXT1	L	L

***1[L(0)]** **In case of EXT LINK1 standby(not EXT LINK2), AV1 PB must not output 'M' or 'H'**
***2[H*] / *3[M/H]** **AV2 PB must not output 'M' or 'H' if AV2 PB IN is 'M' or 'H'.**
***4** **RGB SW output "ON" if AV1PB is "H" or "M". (RGB SW output "OFF" if AV1PB is "L")**

SYSTEM CONTROL & SERVO ICs DC VOLTAGE CHART (SP MODE)

Ref. No.	IC1501								IC1502											
MODE	1	2	3	4					1	2	3	4								
STOP	1.2	2.3	0.1	0.0					0.0	1.2	5.0	0.0								
PLAY	1.2	2.3	4.3	0.0					0.0	1.2	5.0	0.0								
REC	1.2	2.3	4.3	0.0					0.0	1.2	5.0	0.0								
F.F	1.2	2.3	1.2	0.0					0.0	1.2	2.3	0.0								
REW	1.2	2.3	2.2	0.0					0.0	1.2	2.3	0.0								

Ref. No.	IC2501																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
STOP	15.4	15.4	15.6	1.0	5.1	1.1	1.2	0.5	2.4	1.4	-0.1	3.9	3.9	3.9	0.0	15.4				
PLAY	15.0	15.0	15.2	1.0	5.1	1.1	1.2	0.5	2.5	1.4	0.0	3.9	3.9	3.9	0.0	15.0				
REC	15.1	15.0	15.3	1.0	5.1	1.1	1.2	0.5	2.4	1.4	-0.1	3.9	3.9	3.9	0.0	15.0				
F.F	14.7	14.6	14.9	1.1	5.1	1.1	1.2	0.5	2.5	1.4	0.0	3.9	3.9	3.9	0.0	15.0				
REW	14.6	14.6	14.9	1.1	5.1	1.1	1.2	0.5	2.5	1.4	0.0	3.9	3.9	3.9	0.0	14.8				

Ref. No.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.8	4.2	4.8	0.0	0.0	5.1	5.0	5.0	3.3	0.0	0.0	1.4	0.0	5.2	4.8	0.0	4.8	2.4	0.0	0.0
PLAY	4.8	4.2	4.8	0.0	0.0	5.0	5.0	4.5	1.4	4.5	4.8	1.4	0.0	5.2	0.0	0.0	4.9	2.4	2.4	0.0
REC	4.8	4.2	4.8	0.0	0.0	5.0	5.0	4.5	3.3	0.0	4.7	1.4	0.0	5.2	4.8	0.0	4.8	2.4	0.0	0.0
F.F	0.0	4.2	4.8	0.0	0.0	5.1	4.9	4.5	3.4	0.0	5.0	1.4	0.0	5.2	4.8	0.0	4.8	2.4	0.0	0.0
REW	4.8	4.2	4.8	0.0	0.0	5.1	4.9	4.5	3.4	0.0	5.0	1.4	0.0	5.2	4.8	0.0	4.8	2.4	0.0	0.0

Ref. No.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	4.8	0.0	0.0	4.9	1.4	1.5	4.9	2.1	2.0	0.0
PLAY	0.0	0.0	4.2	4.9	0.0	0.0	0.0	0.0	0.0	4.3	4.9	0.0	0.0	4.9	1.4	1.5	4.9	2.1	2.0	0.0
REC	0.0	0.0	4.2	0.0	4.8	4.8	4.8	0.0	0.0	0.0	4.8	0.0	0.0	4.9	1.4	1.5	4.9	2.1	2.0	0.0
F.F	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8	0.0	4.9	1.4	1.5	4.9	2.1	2.0	0.0
REW	0.0	0.0	4.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	4.8	0.0	4.9	1.4	1.6	4.9	2.1	2.0	0.0

Ref. No.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	4.8	0.0	4.8	0.0	0.0	0.0	1.7	2.1	0.0	1.6	2.5	1.6	5.0	2.1	0.0	1.9	0.0	4.8	0.0	0.0
PLAY	4.8	0.0	4.9	0.0	0.0	0.0	1.7	2.1	0.0	1.6	2.5	1.6	5.0	2.1	0.0	1.9	0.0	4.8	0.0	0.0
REC	4.8	0.0	4.8	0.0	0.0	0.0	1.7	2.1	0.0	1.6	2.5	1.6	5.0	2.1	0.0	1.9	0.0	4.8	0.0	0.0
F.F	4.8	0.0	4.8	0.0	0.0	0.0	1.7	2.1	0.0	1.6	2.5	1.6	5.0	2.1	0.0	1.9	0.0	4.8	0.0	0.1
REW	4.8	0.0	4.9	0.0	0.0	0.0	1.7	2.1	0.0	1.6	2.5	1.6	5.0	2.1	0.0	1.9	0.0	4.8	0.0	0.1

Ref. No.	IC6001																			
MODE	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
STOP	4.8	0.0	0.0	2.4	0.0	0.0	0.0	4.7	4.7	4.8	2.9	2.8	0.0	0.0	0.0	0.0	2.4	5.2	0.1	5.0
PLAY	4.8	0.0	0.0	2.4	0.0	0.0	0.0	4.7	4.7	4.8	2.9	2.8	0.0	0.0	0.4	2.5	2.4	5.2	5.0	4.1
REC	4.8	0.0	0.0	2.4	0.0	0.0	0.0	4.7	4.7	4.8	2.9	2.8	0.0	0.0	0.4	2.5	2.4	5.2	5.0	4.3
F.F	4.8	0.0	0.0	2.4	0.0	0.0	0.0	4.6	4.6	4.8	2.9	2.8	0.0	0.0	0.4	4.8	2.5	5.2	2.4	2.2
REW	4.8	0.0	0.0	2.4	0.0	0.0	0.0	4.6	4.6	4.8	2.9	2.8	0.0	4.8	4.5	2.6	2.5	5.2	2.2	2.4

Ref. No.	IC6001																			
MODE	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
STOP	0.0	4.9	0.0	0.0	5.0	2.5	2.5	-0.1	5.0	1.0	2.5	2.5	5.0	2.4	2.4	2.5	2.5	5.1	5.1	0.0
PLAY	0.0	4.9	0.0	0.0	5.0	2.5	2.5	-0.1	5.0	1.1	2.5	2.5	5.0	2.4	2.4	2.5	2.5	5.1	5.1	0.0
REC	0.0	4.9	0.0	0.0	5.0	2.5	2.5	-0.1	5.0	1.0	2.5	2.5	5.0	2.2	2.4	2.7	2.5	5.0	5.0	0.0
F.F	0.0	4.9	0.0	0.0	5.0	2.5	2.5	-0.1	5.0	1.1	2.5	2.5	5.0	2.4	2.4	2.5	2.6	0.0	5.1	1.8
REW	0.0	4.9	0.0	0.0	5.0	2.5	2.5	-0.1	5.0	1.1	2.5	2.5	5.0	2.5	2.5	2.5	2.6	5.1	5.1	1.7

Ref. No.	IC6002							
MODE	1	2	3	4	5	6	7	8
STOP	0.0	0.0	0.0	0.0	2.8	2.9	4.9	5.0
PLAY	0.0	0.0	0.0	0.0	2.8	2.9	4.9	5.1
REC	0.0	0.0	0.0	0.0	2.8	2.9	4.8	5.0
F.F	0.0	0.0	0.0	0.0	2.8	2.9	4.8	5.1
REW	0.0	0.0	0.0	0.0	2.8	2.9	4.8	5.1

Ref. No.	IC6003																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0.0	0.0	-	2.9	2.8	0.0	0.4	-	5.0	0.0	0.0	2.5	-	2.6	2.5	1.5	1.3	-	5.0	5.0
PLAY	0.0	0.0	-	2.9	2.8	0.0	0.4	-	5.0	5.0	0.0	2.6	-	2.6	2.6	1.5	1.3	-	5.0	5.0
REC	0.0	0.0	-	2.9	2.8	0.0	0.4	-	5.0	0.0	0.0	2.5	-	2.5	2.5	1.5	1.3	-	5.0	5.0
F.F	0.0	0.0	-	2.9	2.8	0.0	0.4	-	5.0	0.0	0.0	2.5	-	2.6	2.5	1.5	1.3	-	5.0	5.0
REW	0.0	0.0	-	2.9	2.8	0.0	0.4	-	5.0	0.0	0.0	2.5	-	2.6	2.5	1.5	1.3	-	5.0	5.0

SYSTEM CONTROL & SERVO TRs DC VOLTAGE CHART (SP MODE)

Ref. No.	Q1501				Q1502				Q6004				Q6008				Q6009			
MODE	(–)	(+)			(–)	(+)			E	C	B		E	C	B		E	C	B	
STOP	-0.1	4.5			0.0	5.0			1.4	0.0	0.8		-0.1	12.4	0.0		1.6	5.0	2.3	
PLAY	-0.1	4.6			0.0	5.0			1.2	0.0	0.8		11.8	12.4	12.3		1.6	5.0	2.3	
REC	-0.1	4.6			0.0	5.0			1.4	0.0	0.8		-0.1	12.4	0.0		1.6	5.0	0.0	
F.F	-0.1	4.6			0.0	5.0			1.4	0.0	0.8		-0.1	12.4	0.0		1.6	5.0	2.3	
REW	-0.1	4.7			0.0	4.9			1.4	0.0	0.8		-0.1	12.4	0.0		1.6	5.0	2.3	

Ref. No.	QR6001				QR6004			
MODE	E	C	B		E	C	B	
STOP	0.0	0.0	4.8		-0.1	0.0	4.8	
PLAY	0.0	12.3	0.0		-0.1	0.0	4.8	
REC	0.0	0.0	4.8		-0.1	0.0	4.8	
F.F	0.0	0.0	4.8		-0.1	0.0	4.8	
REW	0.0	0.0	4.8		-0.1	0.0	4.8	

443NT [L]	4.43 NTSC Ⓛ
A. COMP	AUDIO COMPONENT SIGNAL
A. COMPO	AUDIO COMPONENT SIGNAL
A. D.P [L]	AUDIO DUBBING PAUSE Ⓛ
A. D/L [L]	AUDIO DUBBING PAUSE Ⓛ
A. DEF [S]	AUDIO DEFEAT
A. DEF [S] [L]	AUDIO DEFEAT
A. DUB P [L]	AUDIO DUBBING PAUSE Ⓛ
A. DUB [H]	AUDIO DUBBING Ⓗ
A. ERASE	AUDIO ERASE
A. H. SW	AUDIO HEAD SWITCHING PULSE
A. HEAD [R]	AUDIO HEAD (REC)
A. HEAD [W]	AUDIO HEAD (PLAY)
A. IN [L]	AUDIO INPUT (L)
A. IN [R]	AUDIO INPUT (R)
A. MUT [H]	AUDIO MUTE Ⓗ
A. MUTE [H]	AUDIO MUTE Ⓗ
A. OUT [L]	AUDIO OUTPUT (L)
A. OUT [R]	AUDIO OUTPUT (R)
A. RF OUT	AUDIO RF SIGNAL OUTPUT
A/VS/S. DATA	AV SW/SERIAL DATA
AC ONLINE	AC ONLINE
AC. O/EE. H	AC ONLINE/EE Ⓗ
AFC S C	AFC S CURVE
AFC [S]	AFC S CURVE
AFC. DEF	AFC DEFEAT
ARFC OUT	AUDIO RF SIGNAL OUTPUT
ART. V	ARTIFICIAL VERTICAL SYNC SIGNAL
ART. V. MM	ARTIFICIAL VERTICAL SYNC SIGNAL MONO MULTI
ART. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL Ⓗ/NORMAL
AT. V/H/N	ARTIFICIAL VERTICAL SYNC SIGNAL
ATSW/TEST/NOR/SE	TEST/NORMAL/SERVICE
AUDIO IN [L]	AUDIO INPUT (L)
AUDIO IN [R]	AUDIO INPUT (R)
AUDIO OUT [L]	AUDIO OUTPUT (L)
AUDIO OUT [R]	AUDIO OUTPUT (R)
AUDIO SELECT [H]	AUDIO SELECT Ⓗ
AUDIO. L	AUDIO (L)
AUDIO. R	AUDIO (R)
AV CNT	AV CONTROL
AV CTL	AV CONTROL
AV CTL/S. CLK	AV CONTROL/SERIAL CLOCK
AV. C.M.	AV CONTROL MODE
AVCNT/METER. R	AV CONTROL/LEVEL METER (R)
AVSW/METER. L	AV SW/LEVEL METER (L)
B MODE. H	B MODE Ⓗ
B.G.P	BURST GATE PULSE
BACKUP 5V	BACK UP 5V
BAND. U.E.	BAND U
BANDVL. D	BAND VL
BI/MI [L]	BILINGUAL/MIX Ⓛ
BIL	BILINGUAL
BIL [L]	BILINGUAL Ⓛ
BIL. [H]	BILINGUAL Ⓗ
BIL/M1 [L]	BILINGUAL Ⓛ
BS CLOCK	BS CLOCK
BS DATA	BS DATA
BS LCH IN	BS L CHANNEL INPUT
BS MIX [H]	BS MIX Ⓗ
BS MON [H]	BS MONITOR Ⓗ
BS MONI [H]	BS MONITOR Ⓗ
BS RCH IN	BS R CHANNEL INPUT
BS VIDEO	BS VIDEO SIGNAL
BS VIDEO/BS1	BS VIDEO SIGNAL
BS [H]	BS Ⓗ
BS. LEVEL	BS LEVEL
BS. M [H]	BS MONITOR Ⓗ
BS/VTR [H]	BS/VTR Ⓗ
BUS CLK	BUS CLOCK
BUS LSN	BUS LISTEN
BUS TLK	BUS TALK
BUZZER	BUZZER
CAP EC	CAPSTAN TORQUE CONTROL
CAP M GND	CAPSTAN MOTOR GND
CAP. ET	CAPSTAN TORQUE CONTROL
CAP. FG1	CAPSTAN FG1 PULSE
CAP. FG2	CAPSTAN FG2 PULSE
CAS. SW	CASSETTE SW
CCN	PLAYBACK CONTROL SIGNAL (–)
CCP	PLAYBACK CONTROL SIGNAL (+)
CHM	CONTROL SIGNAL (+)
CHP	CONTROL SIGNAL (–)
CINEM [L]	CINEMA Ⓛ
CINEMA [L]	CINEMA Ⓛ
CINEMA/MIX	CINEMA/MIX
CKL	RATCH LOCK
CKS	SHIFT LOCK
CL	CLOCK
CLK	CLOCK
CLK (C.G)	CLOCK
CLOCK. IN	CLOCK INPUT
CLP	CLAMP
COL/B/W/NOR	COLOUR/BLACK & WHITE/NORMAL
COLOR [H]	COLOUR Ⓗ
CONV	CONVERTOR
CS	CHIP SELECT
CTL GND	CONTROL GND
CTL HEAD [+]	CONTROL HEAD (+)
CTL HEAD [–]	CONTROL HEAD (–)
CTL [+]	CONTROL HEAD (+)
CTL [–]	CONTROL HEAD (–)
CUE BIAS	CUE BIAS
CURRENT LIM	CURRENT LIMMITER
CYL ET	CYLINDER TORQUE CONTROL

CYL GND	CYLINDER GND
D.F.M. REC [H]	DELAIED FM RECORDING Ⓗ
D. FM REC [L]	DELAIED FM RECORDING Ⓛ
D. GND	DIGITAL GND
D. REC [H]	DELAYED RECORDING Ⓗ
D4/S. LED	D4/STILL LED
D4/STILLED	D4/STILL LED
DAC [CLK]	TUNER DAC (CLOCK)
DAC/FSCS	TUNER DAC/FS CHIP SELECT
DAREC [H]	DELAYED AUDIO RECORDING Ⓗ
DATA	DATA
DECODER [L]	DECODER (L)
DECODER [R]	DECODER (R)
DEW	DEW
DEW SNS	DEW SENSOR
DFMRE [H]	DELAYED FM AUDIO RECORDING Ⓗ
E. REC 5V	EXCEPT RECORDING 5V
EC	ERROR TORQUE CONTROL
ECR	ERROR TORQUE CONTROL REFERENCE VOLTAGE
EDT TRIG [L]	EDIT TRIGGER Ⓛ
EDIT [H]	EDIT Ⓗ
EE [H]	EE Ⓗ
EE [H]/INS [M]	EE Ⓗ/INSERT Ⓜ
EE. VV. TR	EE/VV/TRICK PLAY
EJECT. PO	EJECT POSITION
EJECT/VDET	EJECT/REVERSE SLOW LOCK
ENV. SEL	ENVELOPE SELECT
ENVE. OUT	ENVELOPE OUTPUT
ENVE. SEL	ENVELOPE SELECT
ENV SELECT	ENVELOPE SELECT
EP [H]	LP Ⓗ
EP/LP [H]	LP Ⓗ
EP/LP/SP	LP/SP
EP/SS [H]	LP/SLOW/STILL/STOP Ⓗ
EPROMCS	EPROM CHIP SELECT
EX. REC 5V	EXCEPT RECORDING 5V
FF/REW [L]	FIRST FORWARD/REWIND Ⓛ
FG1 IN	FG1 PULSE INPUT
FG2 IN	FG2 PULSE INPUT
FILTER ADJUSTMENT	FILTER ADJUSTMENT
FLY ERASE [H]	FLYING ERASE HEAD ON Ⓗ
FLY ON [H]	FLYING ERASE HEAD ON Ⓗ
FLY. E [H]	FLYING ERASE HEAD ON Ⓗ
FM MUT [H]	FM AUDIO MUTE Ⓗ
FM MUTE [H]	FM AUDIO MUTE Ⓗ
FM OUT [L]	FM OUTPUT (L)
FM OUT [R]	FM OUTPUT (R)
FM PACK OUT [L]	FM PACK OUTPUT (L)
FM PACK OUT [R]	FM PACK OUTPUT (R)
FM/BS SEL [L]	FM/BS SELECT (L)
FM/BS SEL [R]	FM/BS SELECT (R)
FS. CLK	FS CLOCK
FUL. E [H]	FULL ERASE HEAD ON Ⓗ
FULL. E [H]	FULL ERASE HEAD ON Ⓗ

FULL. E. 12V	FULL ERASE 12V
GND [A]	GND (ANALOG)
GND [TU]	GND (TUNER)
GND/N. SW. 12V	GND/NON SW 12V
H. SYNC	HORIZONTAL SYNC
H. AMP. SW	HEAD AMP SW PULSE
H. P <R>	HEAD PHONE (R)
H. P <L>	HEAD PHONE (L)
H. P GND	HEAD PHONE GND
H. P OUT [L]	HEAD PHONE OUTPUT (L)
H. P OUT [R]	HEAD PHONE OUTPUT (R)
H. SW	HEAD SW PULSE
HEAD PHONE [L]	HEAD PHONE (L)
HEAD PHONE [R]	HEAD PHONE (R)
HEAD SW	HEAD SW
HEATER [+]	HEATER (+)
HEATER [–]	HEATER (–)
HSS	HORIZONTAL SYNC SIGNAL
HTR [+]	HEATER (+)
HTR [–]	HEATER (–)
I RFE	REFERENCE CURRENT
ICL	CONTROL AGC CIRCUIT
IF	INTERMEDIATE FREQUENCY
IN SELA1	INPUT SELECT A1 POSITION
IN SELA2	INPUT SELECT A2 POSITION
IN SELA3	INPUT SELECT A3 POSITION
INS L/R [L]	INSERT Lch/Rch Ⓛ
INS. [H]	INSERT Ⓗ
INSEL A1	INPUT SELECT A1 POSITION
INSEL A2	INPUT SELECT A2 POSITION
INSERT	INSERT
INSERT [H]	INSERT Ⓗ
IO CS	INPUT/OUTPUT CHIP SELECT
JOG1	JOG1
JOG S3 LED/FOWRD	JOG LED/FORWARD LED
JOG/F. LED	JOG LED/FORWARD LED
JSB [H]	JSB Ⓗ
JST. CLCK	JUST CLOCK
JST. CLK	JUST CLOCK
JST. CLOCK	JUST CLOCK
L. OUT	Lch OUTPUT
L. CH [H]	Lch Ⓗ
L. CH [L]	Lch Ⓛ
LED (MAIN)	LED (MAIN)
LED (STEREO)	LED (STEREO)
LED (SUB)	LED (SUB)
LED CKL	LED SERIAL CLOCK
LED CKS	LED SERIAL CLOCK
LED DATA	LED SERIAL DATA
LINE IN 1 [L]	LINE INPUT 1 (L)
LINE IN 1 [R]	LINE INPUT 1 (R)
LINE IN 2 [L]	LINE INPUT 2 (L)
LINE IN 2 [R]	LINE INPUT 2 (R)
LINE IN V	LINE INPUT VIDEO
LINE IN [L]	LINE INPUT (L)

LINE IN [R]	LINE INPUT (R)
LINE OUT [L]	LINE OUTPUT (L)
LINE OUT [R]	LINE OUTPUT (R)
LP [H]	LP Ⓗ
LPTRI [L]	LP TRICK PLAY Ⓛ
Lch/A. DUB	Lch/AUDIO DUBBING
M GND	MOTOR GND
M REG	MOTOR REGULATOR
MAIN OUT	MAIN OUTPUT
MAIN [L]	MAIN Ⓛ
MAIN/MONO	MAIN/MONAURAL
MAX IN	MAXIMAM INPUT
MES [H]	MESECAM Ⓗ
MESE [H]	MESECAM Ⓗ
MESE [L]	MESECAM Ⓛ
METER 5V	LEVEL METER 5V
METER [L]	LEVEL METER (L)
METER [R]	LEVEL METER (R)
METER. L/AVS	LEVEL METER (L)
METER. R/AVC	LEVEL METER (R)
MI/BI [L]	MIX Ⓗ/BILIGUAL
MIC GND	MIC GND
MIC IN	MIC INPUT
MIC IN [L]	MIC INPUT (L)
MIC IN [R]	MIC INPUT (R)
MIC [H]	MIC Ⓗ
MIX [H]	MIX Ⓗ
MIX [H]/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINE	MIX Ⓗ/CINEMA SOUND Ⓛ
MIX/CINEMA [L]	MIX Ⓗ/CINEMA SOUND Ⓛ
MN. H/M. L	MONAURAL Ⓗ/MAIN Ⓛ
MN. H/MAI. L	MONAURAL Ⓗ/MAIN Ⓛ
MN2/MES. L	MONAURAL 2/MESECAM Ⓛ
MODE SEL	AUDIO MODE SELECT
MODE SW	AUDIO MODE SW
MODE. S. IN	AUDIO MODE SELECT INPUT
MODE. S. OUT	AUDIO MODE SELECT OUTPUT
MONO [H]	MONAURAL Ⓗ
MONO [H]/MAIN [L]	MONAURAL Ⓗ/MAIN Ⓛ
MONO2 [L]	MONAURAL 2
MONO2/MESE [FM(L)]	MONAURAL 2/MESECAM (FM Ⓛ)
MOTOR GND	MOTOR GND
MUTE	MUTE
N. A. REC [L]	NORMAL AUDIO RECORDING
N. SW 12V	NON SW 12V
N. SW. 5. DET	NON SW 5V DETECT
NICAM	NICAM
NICAM [L]	NICAM Ⓛ
NOL [H]	PAL Ⓗ/4.43 NTSC Ⓜ/3.58 NTSC Ⓛ
NOR/SOFT [H]	NORMAL/SOFT TAPE PLAY Ⓗ
NORMAL [H]	NORMAL Ⓗ
NR BIAS	NR BIAS
NTSC [L]	NTSC Ⓛ
OCH	CONTROL AGC CIRCUIT
OUT	OUTPUT

P-OFF [H]	POWER OFF Ⓗ
P-OFF [L]	POWER OFF Ⓛ
P. FAIL	POWER FAILURE DETECT
P. OFF [H]	POWER OFF Ⓗ
P. OFF [L]	POWER OFF Ⓛ
PAL [H]	PAL Ⓗ
PAL [L]/NTSC [H]	PAL Ⓛ/NTSC Ⓗ
PB ADJ OUT	PLAYBACK ADJUST OUTPUT
PB OUT	PLAYBACK OUTPUT
PB. H	PLAYBACK Ⓗ
PFG	PG/FG
PHOTSN +B	PHOTO SENSOR +B
PICT. CNT	PICTURE CONTROL
PLAY LED/RVS LED	PLAY LED/REVERSE LED
PLAY. PO	PLAY POSITION
PLAY/R. LED	PLAY LED/REVERSE LED
PLY/DEW	PLAY/DEW Ⓗ
POWER OFF [L]	POWER OFF Ⓛ
PREROLL [H]	PREROLL Ⓗ
PWRFAIL	POWER FAILURE DETECT
R. CH [H]	Rch Ⓗ
R. CH [L]	Rch Ⓛ
R. ST	RESET
R/S/F	REVERSE Ⓗ/STOP Ⓜ/FORWARD Ⓛ
RCH [H]	Rch Ⓗ
REC 12V	RECORDING 12V
REC CHROMA	RECORDING CHROMINANCE SIGNAL
REC H	RECORDING Ⓗ
REC IN	RECORDING INPUT
REC OUT [L]	RECORDING OUTPUT Ⓛ
REC START	RECORDING START
REC VR [C]	RECORDING VOLUME (COMMON)
REC VR [L]	RECORDING VOLUME (L)
REC VR [R]	RECORDING VOLUME (R)
REC Y	RECORDING LUMINANCE SIGNAL
REC [H]	RECORDING Ⓗ
REC. C	RECORDING CHROMINANCE SIGNAL
REC. Y	RECORDING LUMINANCE SIGNAL
REC/EE CTL	RECORDING/EE CONTROL
REEL-T	REEL PULSE (TAKE-UP)
REEL-S	REEL PULSE (SUPPLY)
REGULATOR FILTER	REGULATOR FILTER
RESET	RESET
REV M F/R	REVIEW MOTOR FORWARD/REVERSE
REV M V1	REVIEW MOTOR V1
REV M V2	REVIEW MOTOR V2
REV MOTOR F/R	REVIEW MOTOR FORWARD/REVERSE
REV MOTOR V1	REVIEW MOTOR V1
REV MOTOR V2	REVIEW MOTOR V2
REV MOTOR [+]	REVIEW MOTOR (+)
REV MOTOR [–]	REVIEW MOTOR (+)
REV. M. GND	REVIEW MOTOR GND
RF. CHROMA	RF CHROMINANCE SIGNAL

RF OUT	RF OUTPUT
RF Y	RF LUMINANCE SIGNAL
RF. Y. IN	RF LUMINANCE SIGNAL INPUT
RF. Y. OUT	RF LUMINANCE SIGNAL OUTPUT
ROTAR. SW	ROTARY SW
ROTARY	ROTARY SW
RST	RESET
RST [L]	RESET Ⓛ
Rch/INST	Rch/INSERT
S IN	SERIAL DATA INPUT
S OUT	SERIAL DATA OUTPUT
S-PHOTO	SUPPLY PHOTO TRANSISTOR
S-RL. PLS	SUPPLY REEL PULSE
S. CLK	SERIAL CLOCK
S. CLK/AV	SERIAL CLOCK/AV
S. DATA	SERIAL DATA
S. DATA/A	SERIAL DATA
S. PHOTO	SUPPLY PHOTO TRANSISTOR
S. TAB [L]	SAFETY TAB SW ON Ⓛ
S/P/N	SECAM/PAL/NTSC
SC IN	SERIAL CLOCK INPUT
SC OUT	SERIAL CLOCK OUTPUT
SCK SELECT	SERIAL CLOCK SELECT
SEL OUT [L]	SELECT OUTPUT (L)
SEL OUT [R]	SELECT OUTPUT (R)
SHUTTLE 1	SHUTTLE 1
SIF	SOUND INTERMEDIATE FREQUENCY
SLMUT [H]	INPUT SELECT MUTE Ⓗ
SLNID [+]	SOLENOID (+)
SLNID [–]	SOLENOID (–)
SLW TR. MM	SLOW TRACKING MONO MULTI
SLW TR. REF	SLOW TRACKING REFERENCE VOLTAGE
SNS. GND	SENSOR GND
SOFT [H]	SOFT TAPE PLAY Ⓗ
SOFT [H]/NORMAL	SOFT TAPE PLAY Ⓗ/NORMAL Ⓗ
SOLENOID ON [L]	SOLENOID ON Ⓛ
SP [H]	SP Ⓗ
SP/L/SLP	SP/LP
SSS [L]	SLOW/STILL/STOP
STEREO LED	STEREO LED
STEREO [H]	STEREO Ⓗ
STEREO [L]	STEREO Ⓛ
STOP. PO	STOP POSITION
STOP/5V	STOP POSITION/5V
STOP1/TAPE SEL	STOP1 POSITION/TAPE SELECT
STOP1/PAL:ST	STOP1 POSITION/PAL
STOP2. PO	STOP 2 POSITION
STOP2/S-TAB	STOP 2 POSITION/SAFETY TAB SW
STREO [H]	STEREO Ⓗ
SUB BIAS	SUB BIAS
SUB. SW	SUB SW
SVHS CAS [L]	S-VHS CASSETTE Ⓛ
SW. 5. DET	SW 5V DETECT
SYNC [L]	SYNC Ⓛ
SYSCON 5V	SYSTEM CONTROL 5V
SYSTEM	SYSTEM SW
T-PHOTO	TAKE-UP PHOTO TRANSISTOR
T-RL. PLS	TAKE-UP REEL PULSE
T. BUSCLK	TIMER BUS CLOCK
T. BUSLSN	TIMER BUS LISTEN
T. BUSTLK	TIMER BUS TALK
T. END [L]	TAPE END Ⓛ
T. PHOTO	TAKE-UP PHOTO TRANSISTOR
TAPE END [L]	TAPE END Ⓛ
TAPE END [L]/CAM	TAPE END Ⓛ/CAMERA PAUSE
TEST	TEST MODE
TPZ	TRAPEZOIDAL WAVE CIRCUIT
TRIC [L]	TRIC PLAY Ⓛ
TRICK [L]	TRIC PLAY Ⓛ
TRK. ENV	AUTO TRACKING ENVELOPE DETECT
TU. AUDIO	TUNER AUDIO
TU. GND	TUNER GND
TU. V. IN	TUNER VIDEO SIGNAL INPUT
TU. VIDEO	TUNER VIDEO
TUN NOR IN	TUNER NORMAL INPUT
TUN R	TUNER AUDIO (R)
TUN. AUDIO IN	TUNER AUDIO INPUT
TUNER 12V	TUNER 12V
TUNER L	TUNER AUDIO (L)
TUNER V IN	TUNER VIDEO SIGNAL INPUT
TUNER [L]	TUNER AUDIO (L)
TUNER [N]	TUNER AUDIO (NORMAL)
TUNER [R]	TUNER AUDIO (R)
TUNER. 12	TUNER 12V
TUOFF [H]	TUNER OFF Ⓗ
TV. AUDIO	TV AUDIO
TV/VTR	TV/VTR
TXTON [L]	TEXT ON Ⓛ
U. REG45V	UNREGULATOR 45V
UNREG	UNREGULATOR
UNREG19V	UNREGULATOR 19V
V. REF	REFERENCE VOLTAGE
V. EE [H]	VIDEO EE Ⓗ
V. EE [L]	VIDEO EE Ⓛ
VCO REF	REFERENCE OSCILLATER
VD. IN	VIDEO SIGNAL INPUT
VD. OUT	VIDEO SIGNAL OUTPUT
VIDEO EE [L]	VIDEO EE Ⓛ
VIDEO IN	VIDEO SIGNAL INPUT
VIDEO OUT	VIDEO SIGNAL OUTPUT
VM	MOTOR VOLTAGE
VM DOWN [L]	MOTOR VOLTAGE DOWN Ⓛ
VSS	VERTICAL SYNC SIGNAL
VTR [H]	VTR Ⓗ
VTR. 12V	VTR 12V
X IN	OSCILLATOR INPUT
X OUT	OSCILLATOR OUTPUT

For your safety please read the following text carefully

This appliance is supplied with a moulded three pin mains plug for your safety and convenience.

A 5 amp fuse is fitted in this plug.

Should the fuse need to be replaced please ensure that the replacement fuse has a rating of 5 amps and that it is approved by ASTA or BSI to BS 1362.

Check for the ASTA mark or the BSI mark on the body of the fuse.

If the plug contains a removable fuse cover you must ensure that it is refitted when the fuse is replaced.

If you lose the fuse cover the plug must not be used until a replacement cover is obtained.

A replacement fuse cover can be purchased from your local Panasonic Dealer.

IF THE FITTED MOULDED PLUG IS UNSUITABLE FOR THE SOCKET OUTLET IN YOUR HOME THEN THE FUSE SHOULD BE REMOVED AND THE PLUG CUT OFF AND DISPOSED OF SAFELY.

THERE IS A DANGER OF SEVERE ELECTRICAL SHOCK IF THE CUT OFF PLUG IS INSERTED INTO ANY 13 AMP SOCKET.

If a new plug is to be fitted please observe the wiring code as shown below.

If in any doubt please consult a qualified electrician.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this appliance may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

The wire which is coloured BLUE must be connected to the terminal in the plug which is marked with the letter N or coloured BLACK.

The wire which is coloured BROWN must be connected to the terminal in the plug which is marked with the letter L or coloured RED.

Under no circumstance should either of these wires be connected to the earth terminal of the three pin plug, marked with the letter E or the Earth Symbol ⏚.

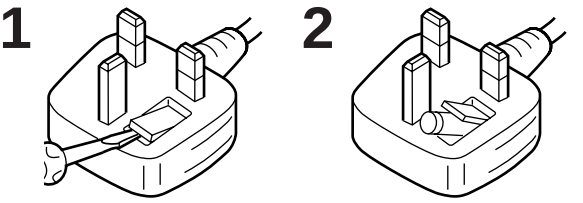
How to replace the Fuse

- There are two types of the AC Mains Lead assembly: **A** and **B** as shown below.

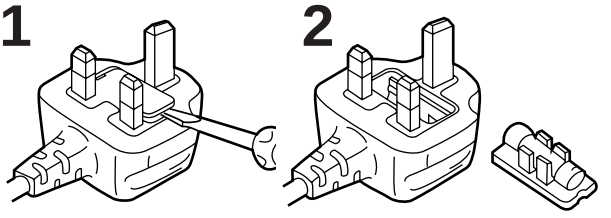
1 Open the fuse compartment with a screwdriver.

2 Replace the fuse and fuse cover.

TYPE A



TYPE B

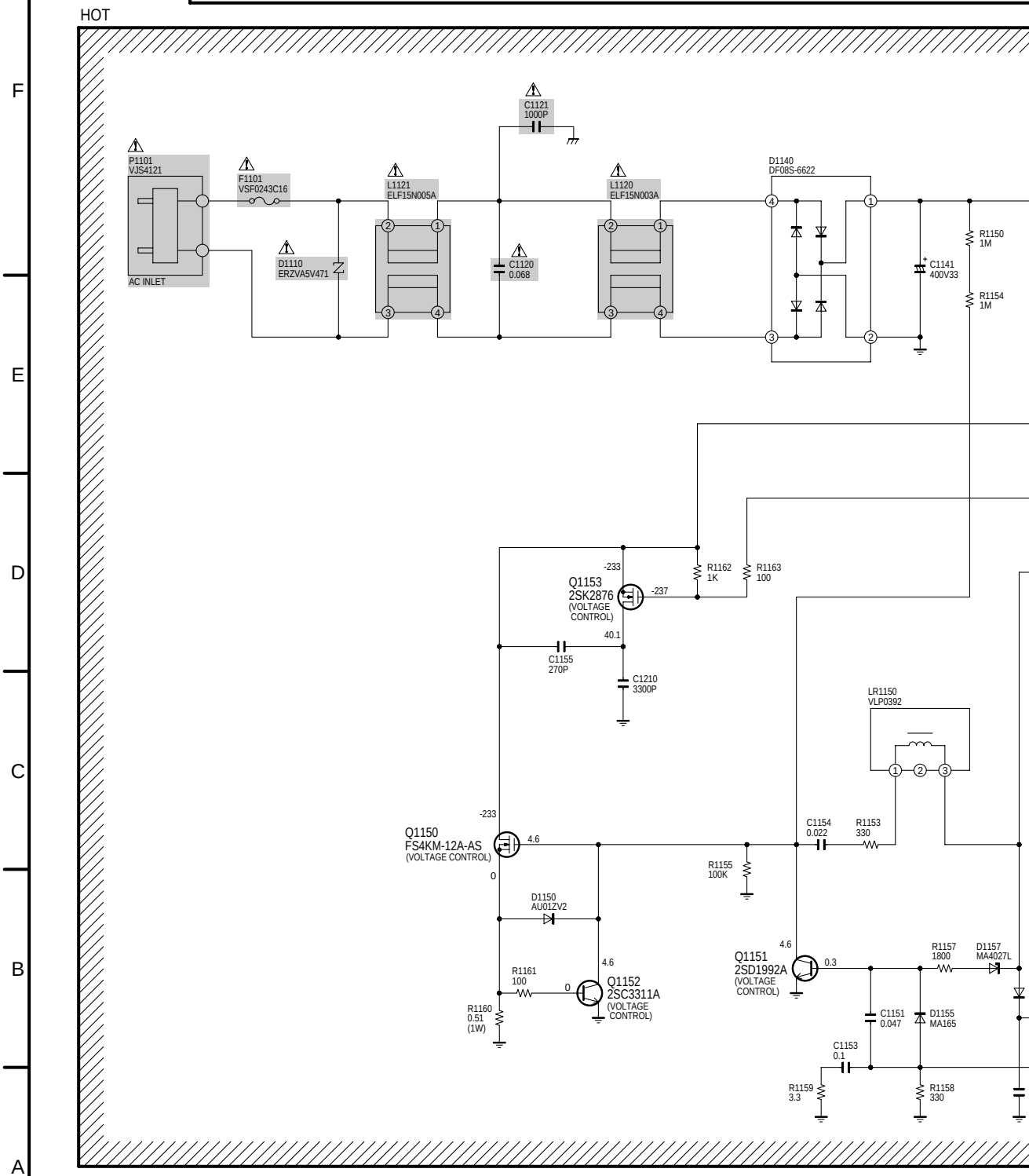


8 SCHEMATIC DIAGRAMS

8.1. POWER TRANSFORMER SECTION IN MAIN SCHEMATIC DIAGRAM

CAUTION

THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMA
FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVIC
THE PRODUCTS.

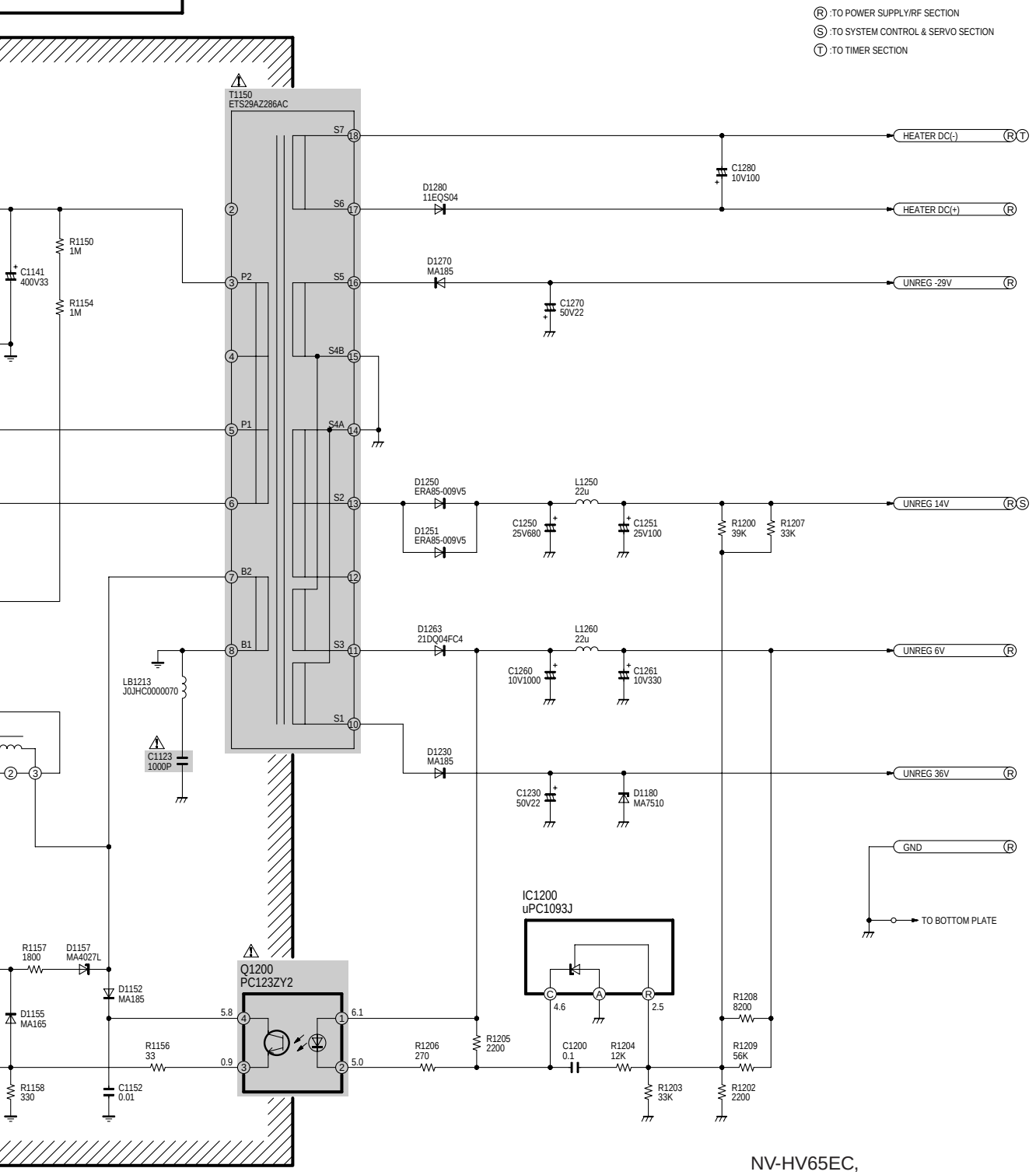


IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE1:WHEN MEASURE THE VOLTAGE OR WAVEFORM ON THE POWER TRA
CIRCUIT,SET THE GND TERMINAL OF MEASURING POINT AS FOLLOWS
PRIMARY SIDE.....
SECONDARY SIDE...
NOTE2:THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS SHOWN THE VOLTA
INPUT AC IS 240V.

M

SH THE PRIMARY
IR AND SERVICE OF



M ON THE POWER TRANSFORMER
NG POINT AS FOLLOWS.

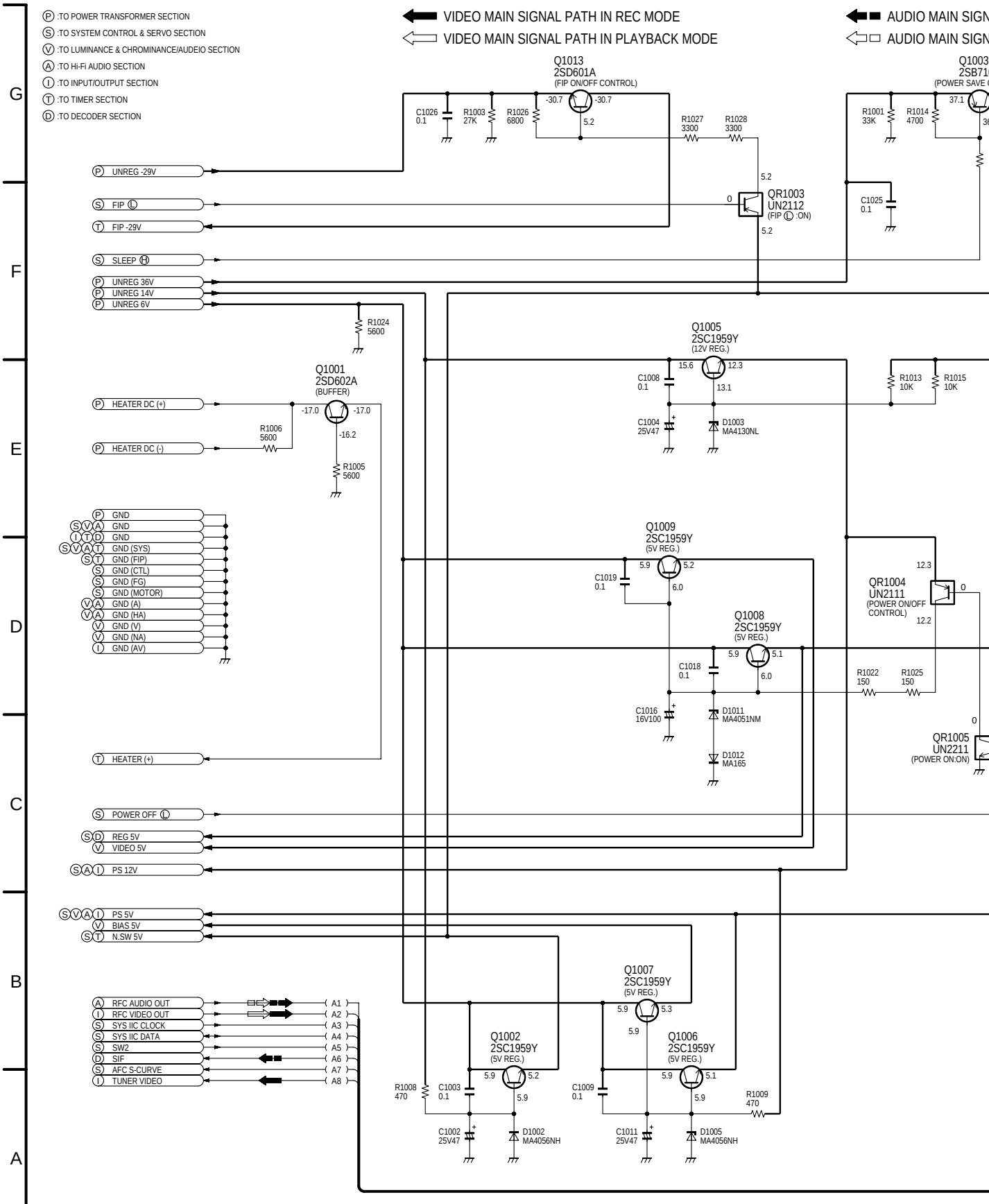
E IS SHOWN THE VOLTAGE WHEN

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.
NOTE:THE MEASURMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
POWER TRANSFORMER
SECTION SCHEMATIC DIAGRAM

5 | 6 | 7 | 8 | 9 | 10

8.2. POWER SUPPLY/ RF SECTION IN MAIN SCHEMATIC DIAGRAM

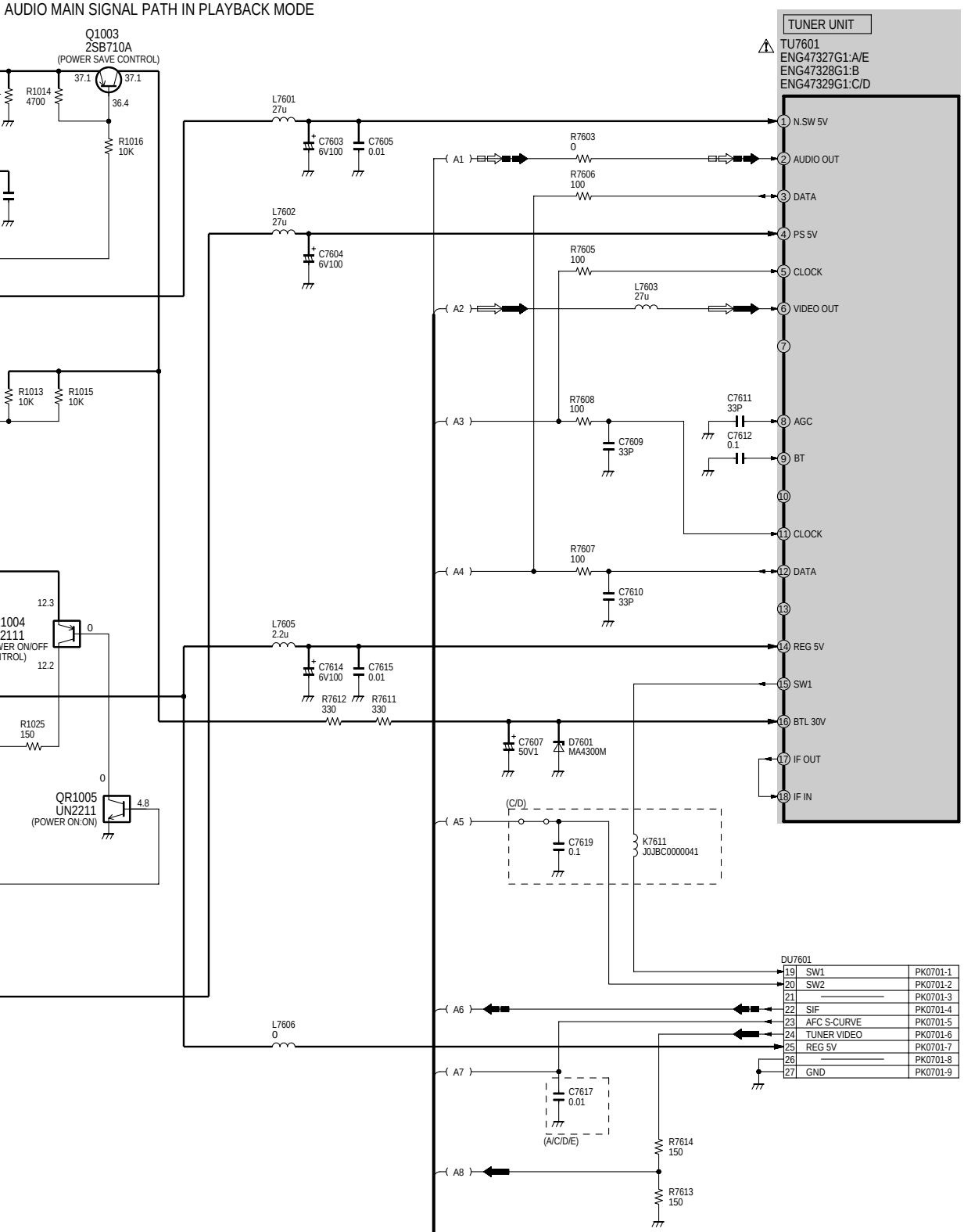


IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MOD

AUDIO MAIN SIGNAL PATH IN REC MODE

AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



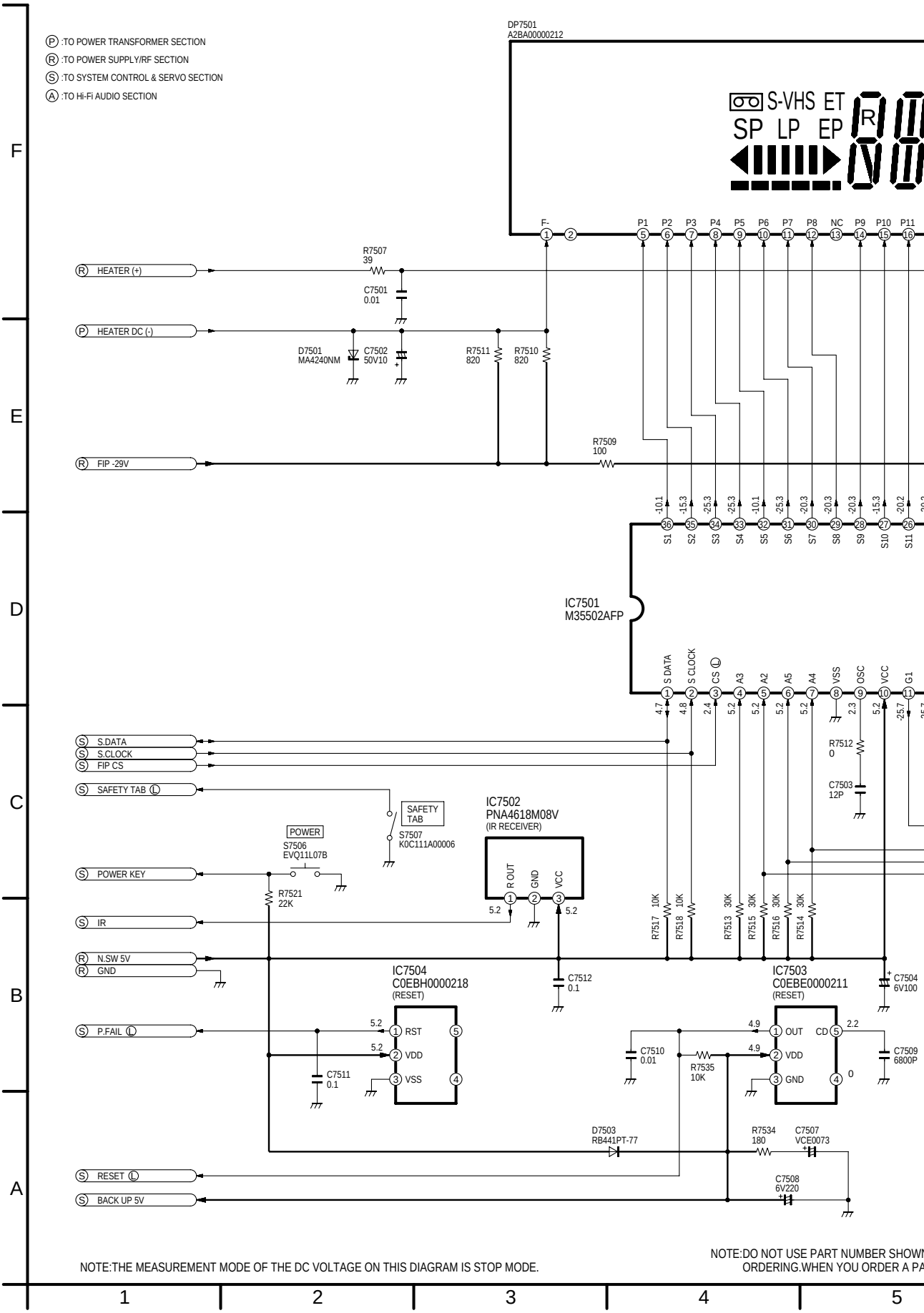
NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
POWER SUPPLY/RF
SECTION SCHEMATIC DIAGRAM

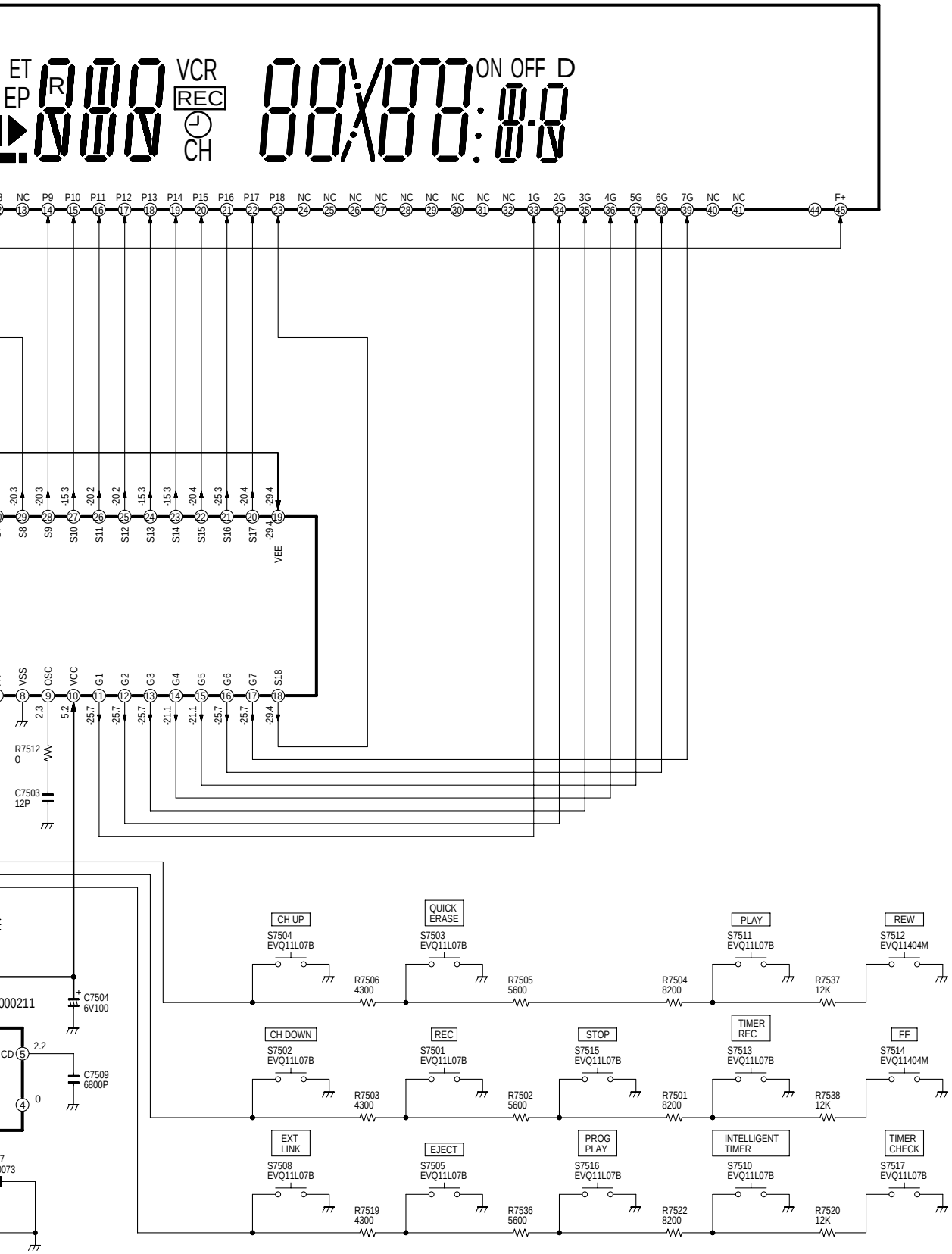
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

IAGRAM IS STOP MODE.

6 7 8 9 10

8.3. TIMER SECTION IN MAIN SCHEMATIC DIAGRAM



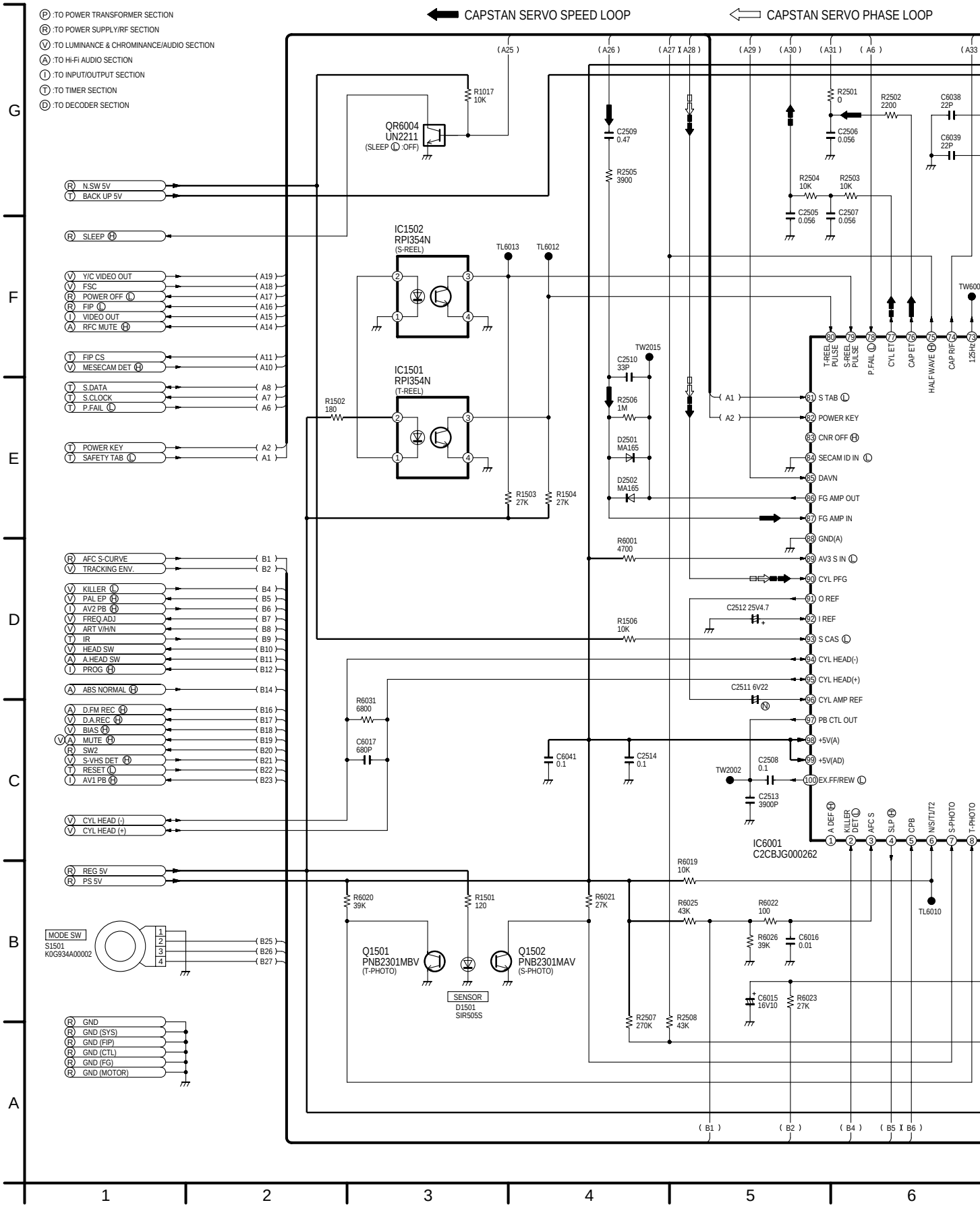


PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR
HEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

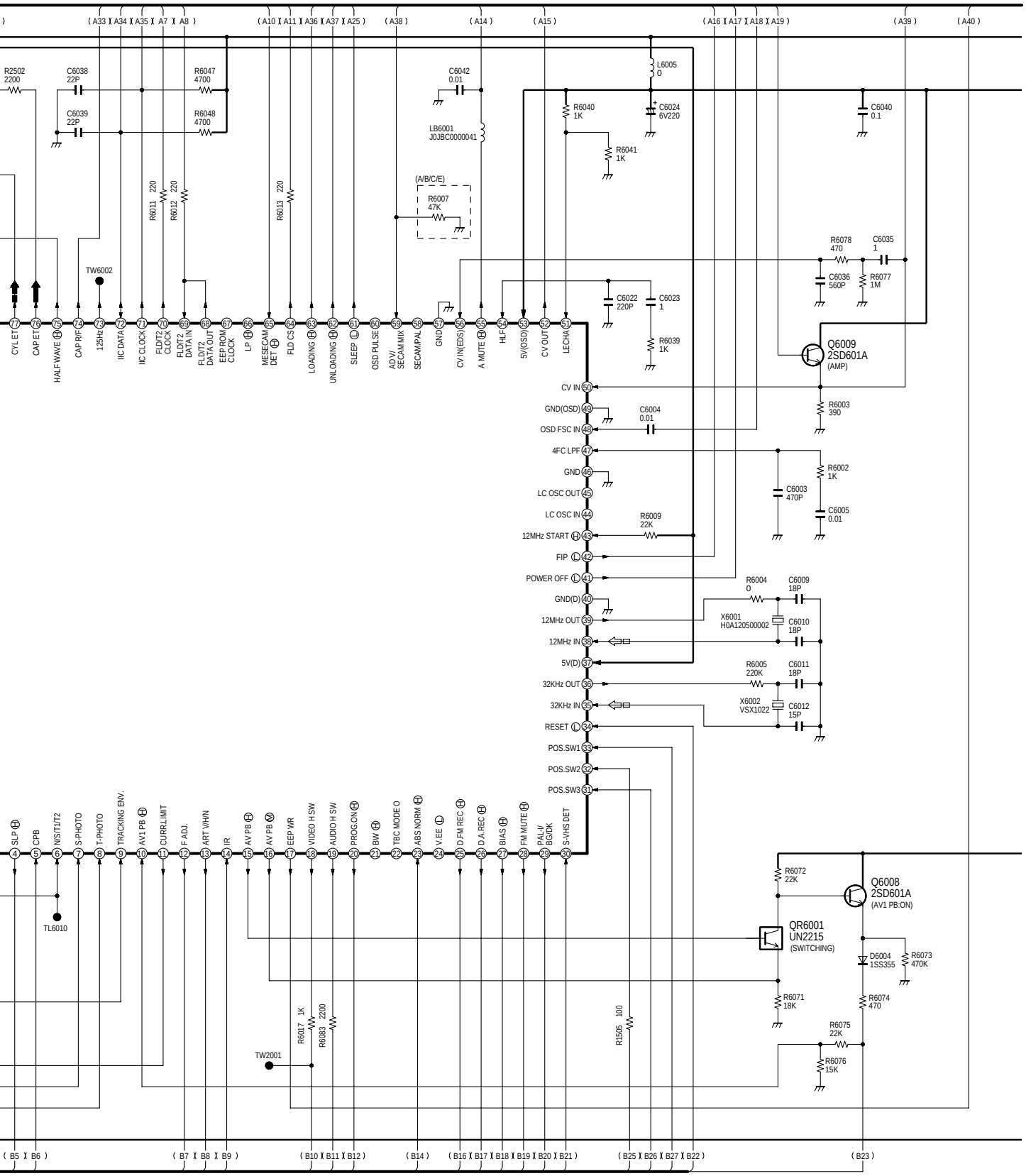
NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
TIMER SECTION SCHEMATIC DIAGRAM

5 6 7 8 9

8.4. SYSTEM CONTROL & SERVO SECTION IN MAIN SCHEMATIC DIAGRAM

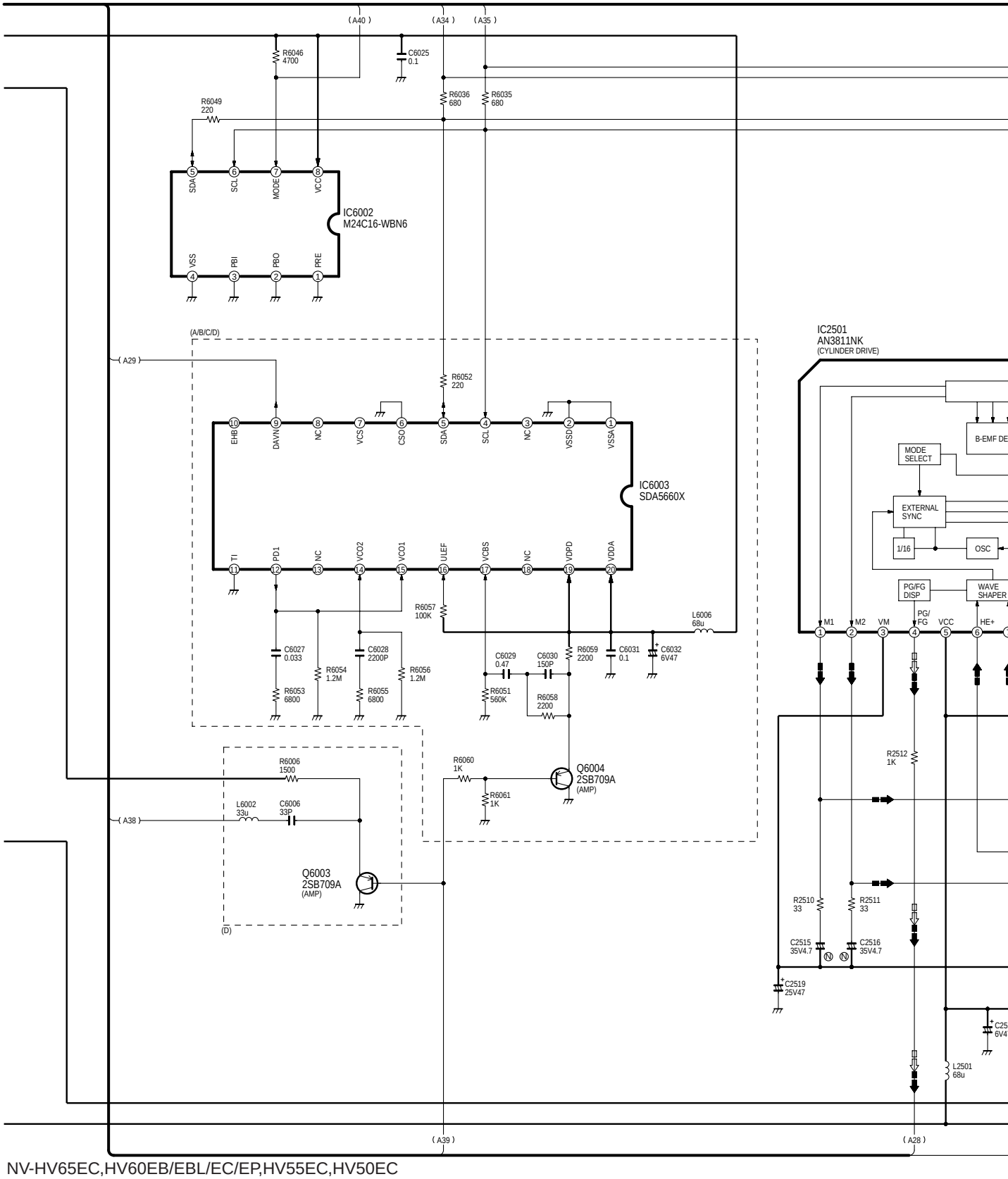


ASE LOOP CYLINDER SERVO SPEED LOOP CYLINDER SERVO PHASE LOOP



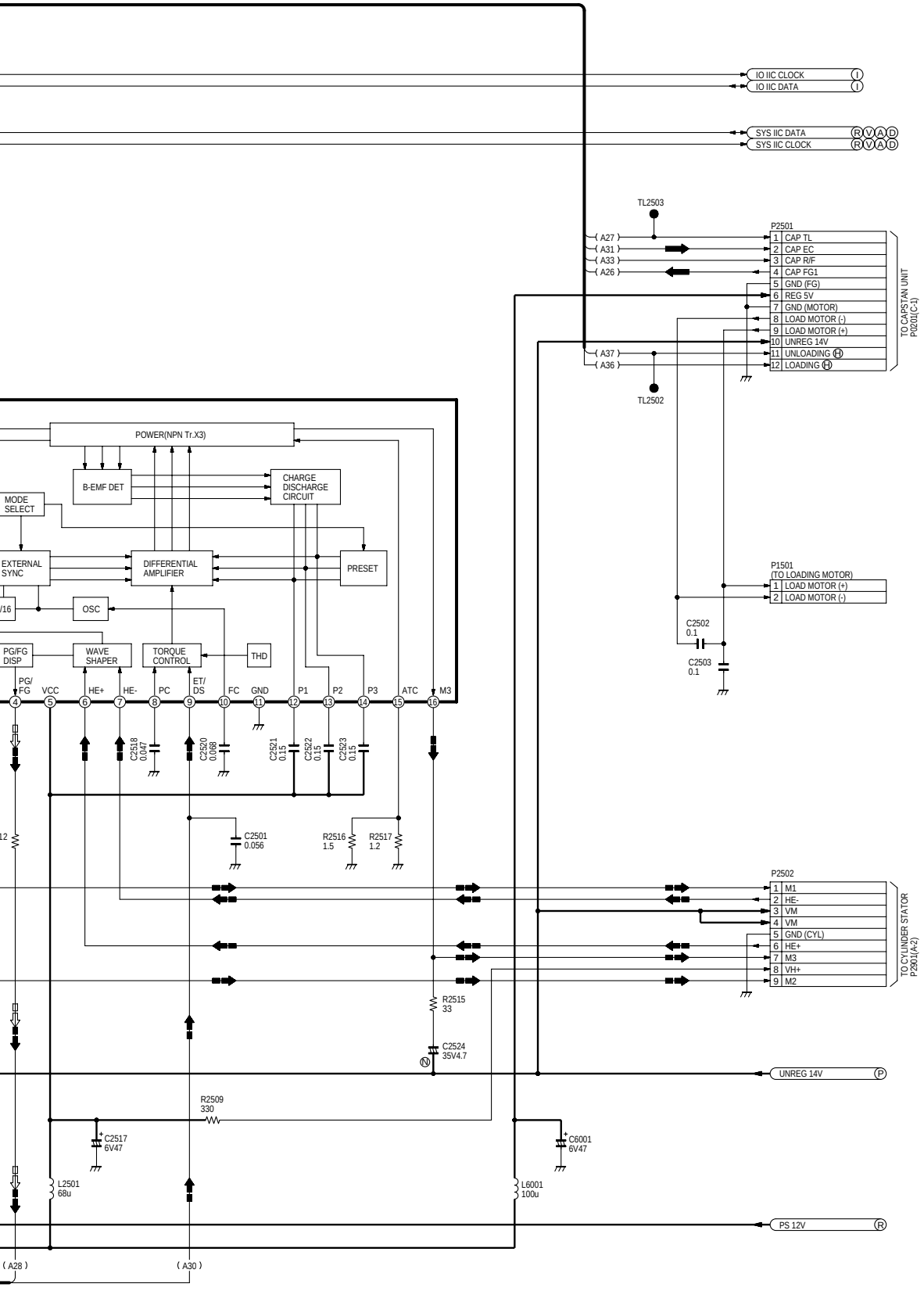
NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
SYSTEM CONTROL & SERVO SECTION SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10 | 11



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
SYSTEM CONTROL & SERVO SECTION SCHEMATIC DIAGRAM

12 | 13 | 14 | 15 | 16 | 17

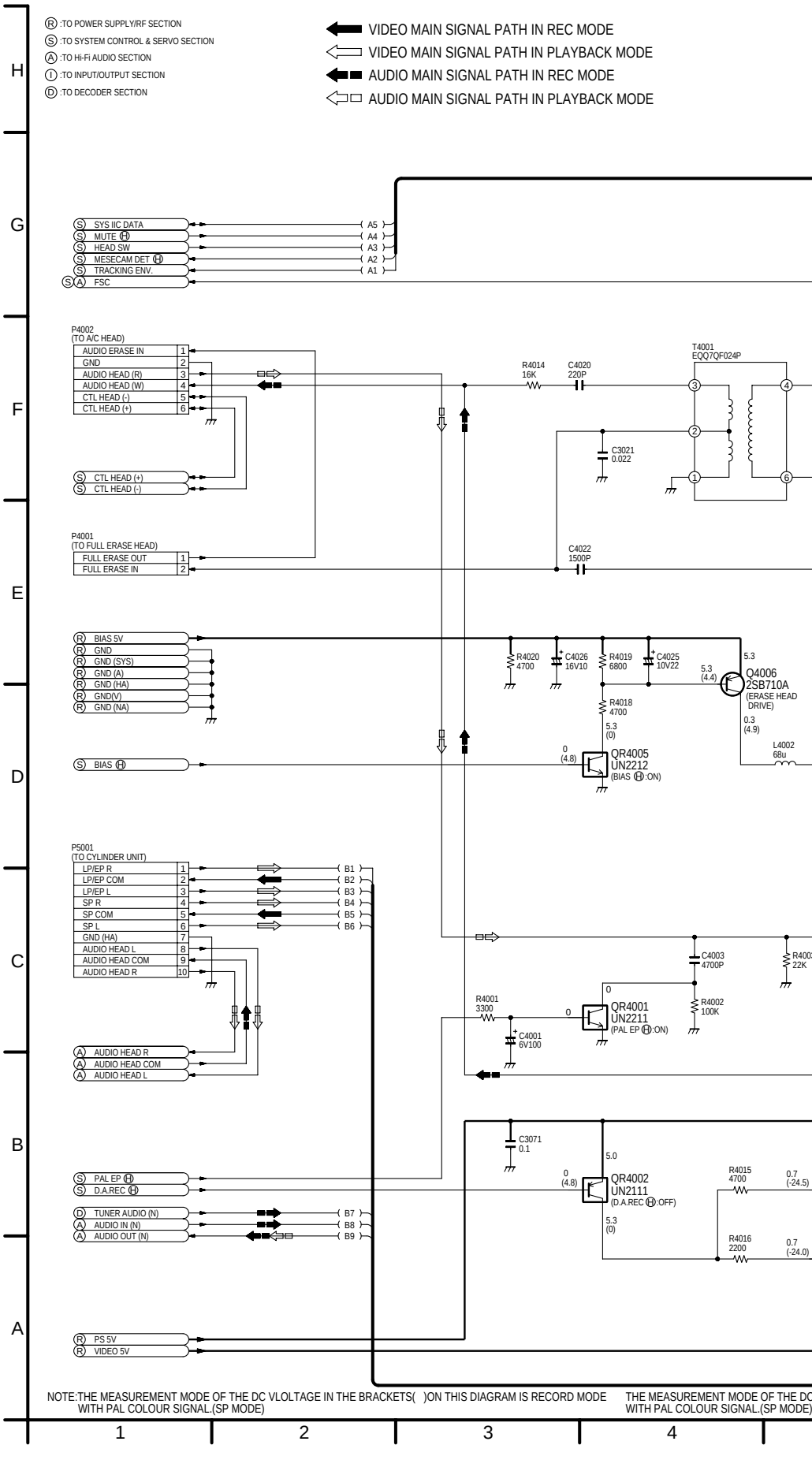


NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

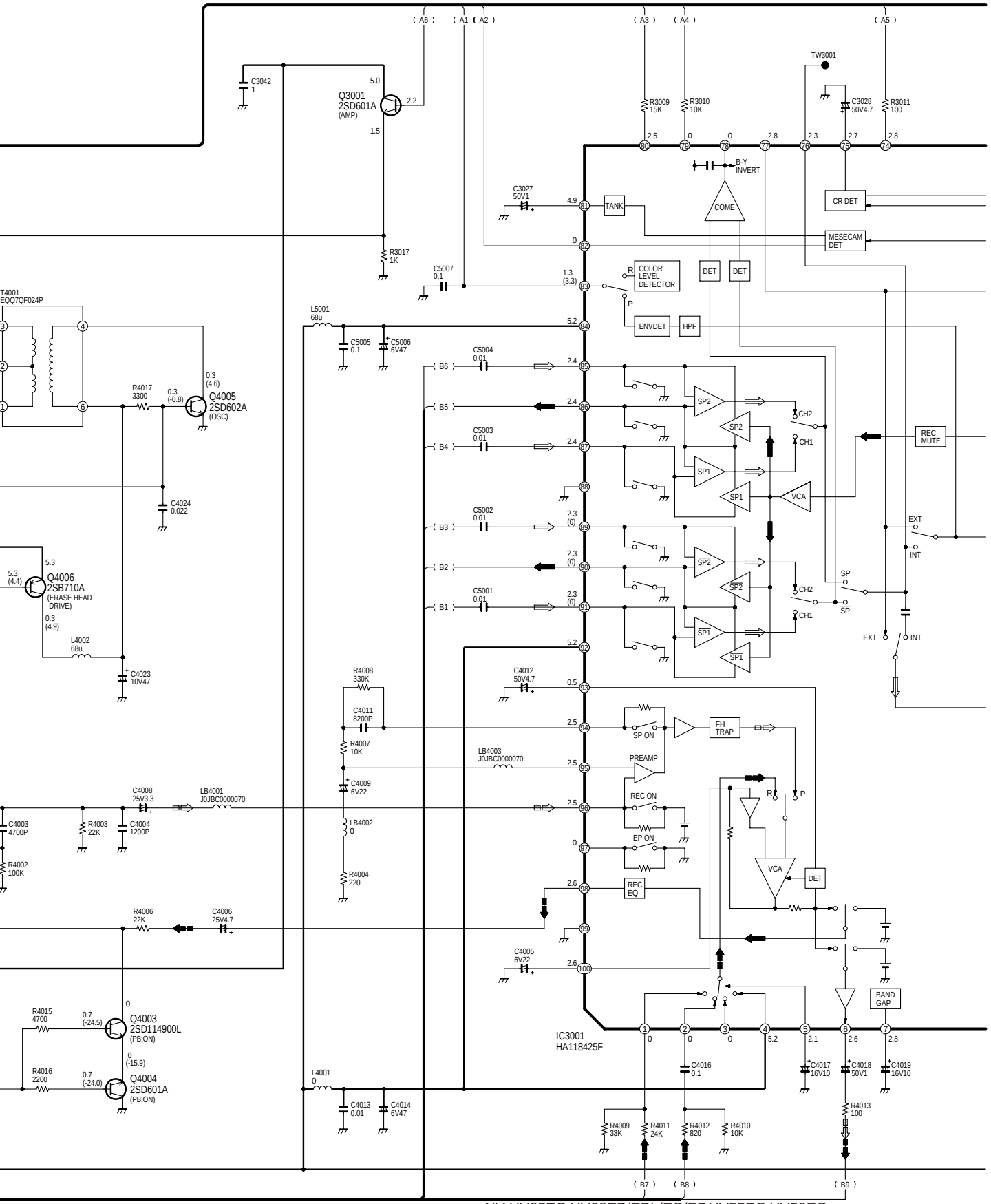
17 | 18 | 19 | 20 | 21

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
SYSTEM CONTROL &
SERVO SECTION
SCHEMATIC DIAGRAM

8.5. LUMINANCE & CHROMINANCE/ AUDIO SECTION IN MAIN SCHEMATIC DIAGR



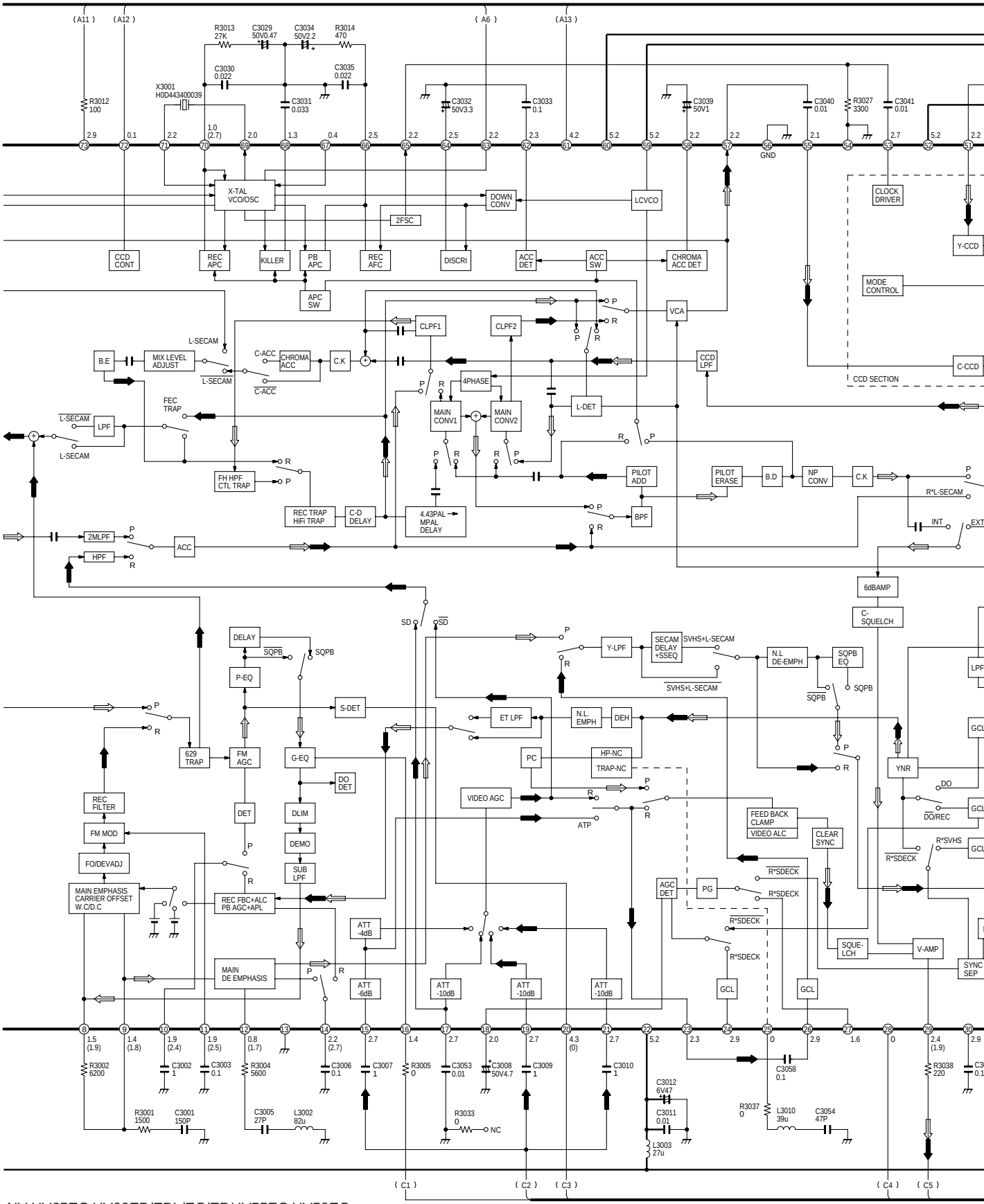
C DIAGRAM



EMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE
LOUR SIGNAL.(SP MODE)

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
LUMINANCE & CHROMINANCE/AUDIO SECTION SCHEMATIC DIAGRAM

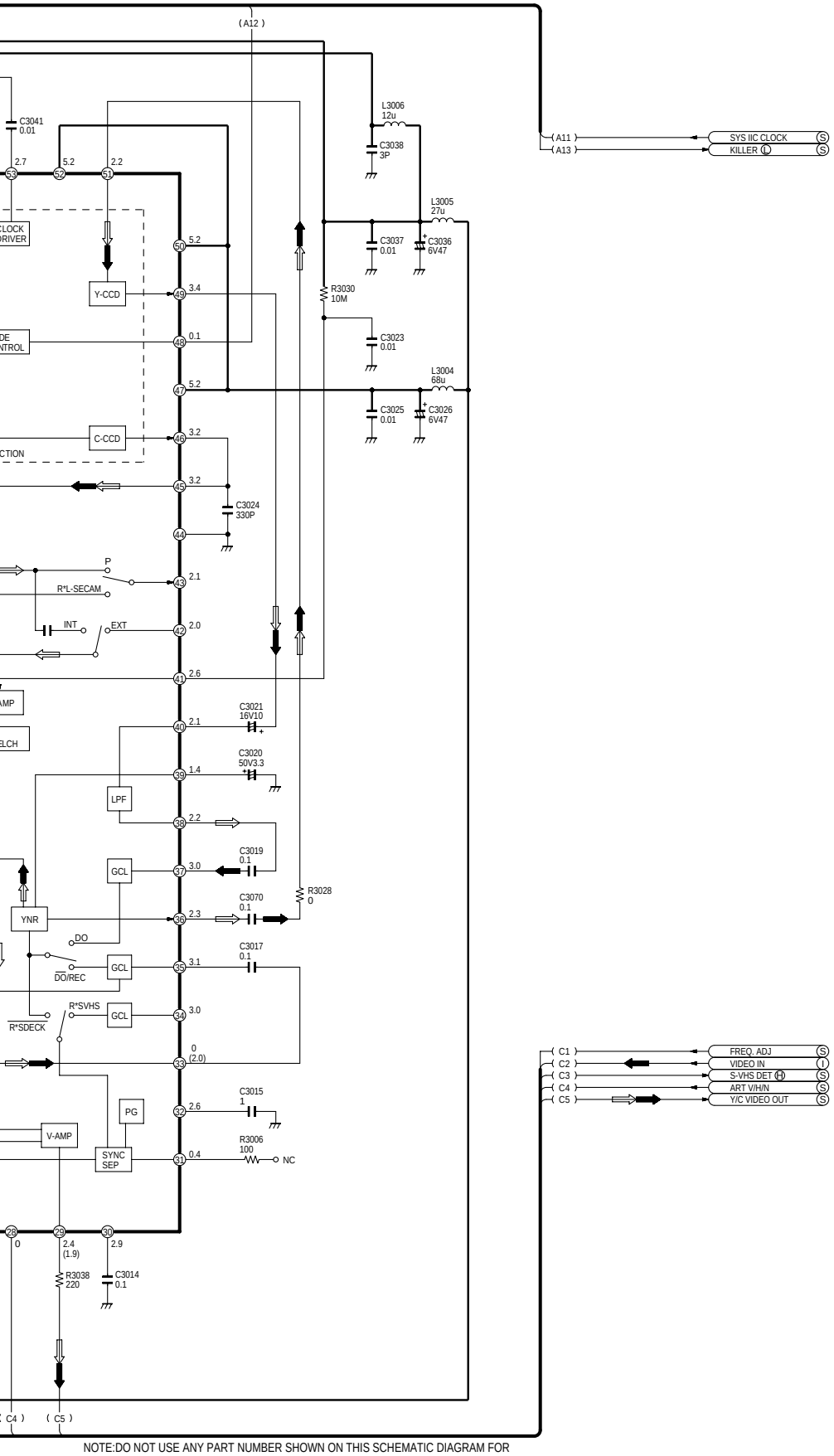
5 6 7 8 9 10



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
LUMINANCE & CHROMINANCE/AUDIO SECTION SCHEMATIC DIAGRAM

NOTE:DO
OF

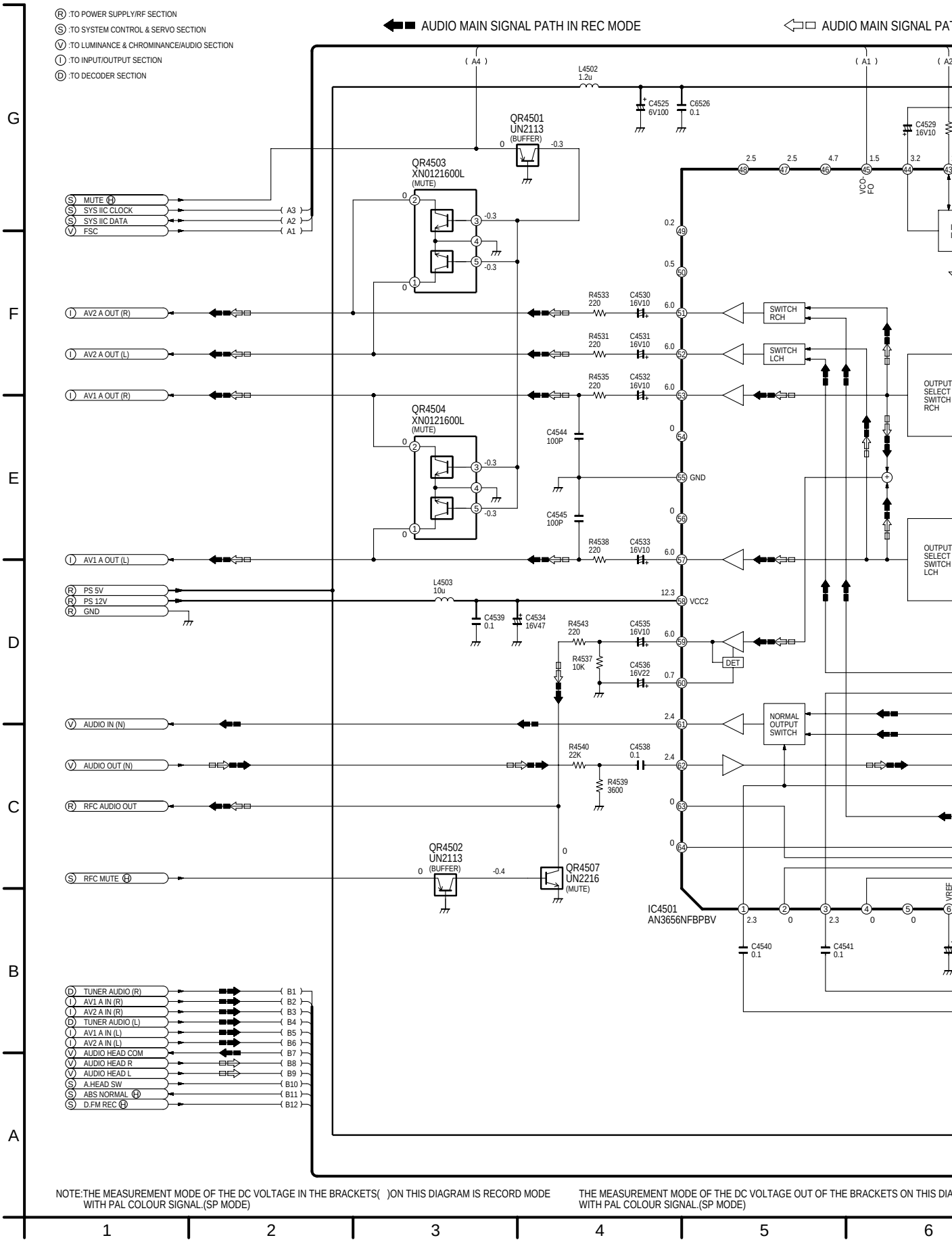
11 12 13 14 15 16



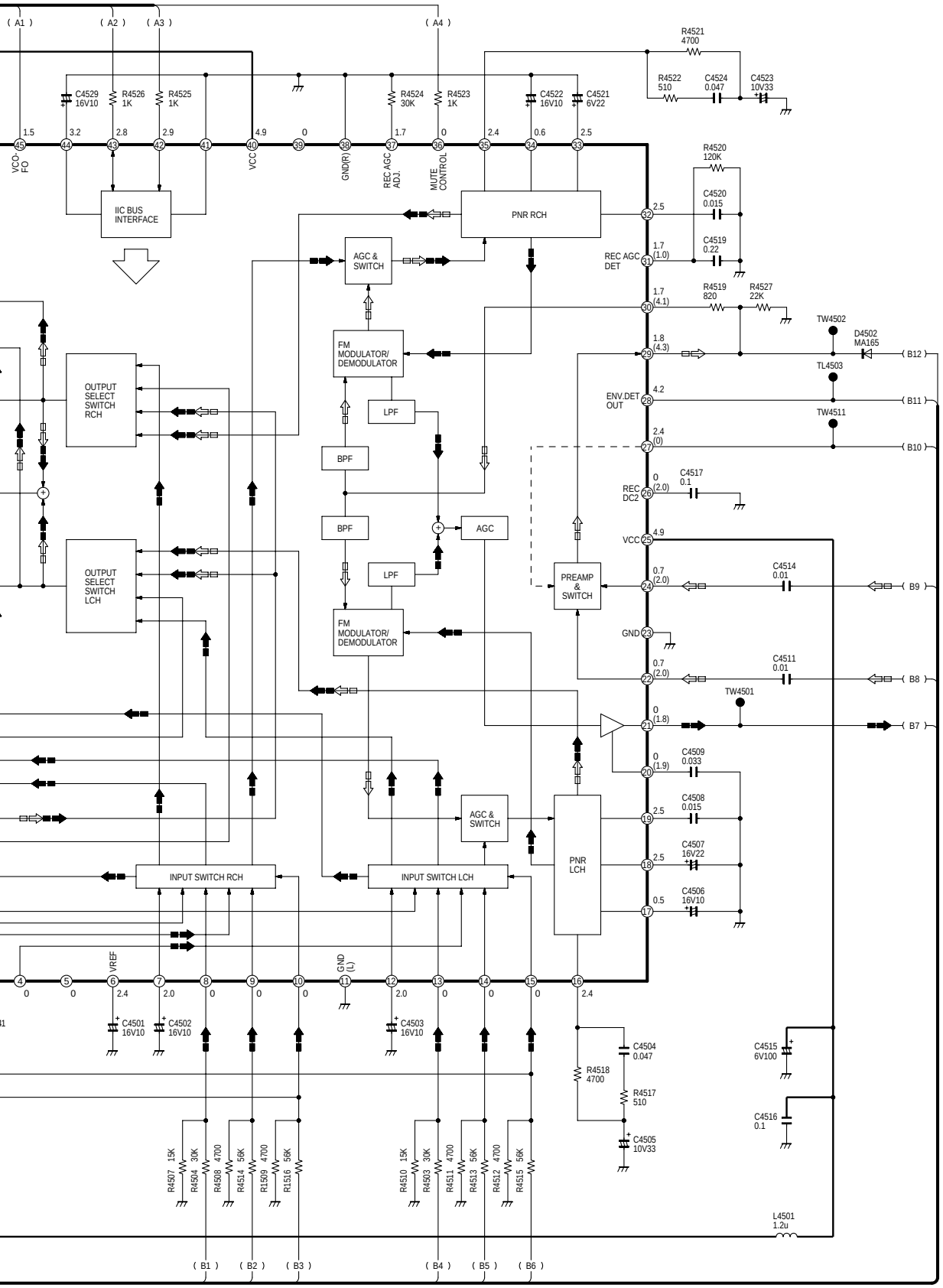
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
LUMINANCE & CHROMINANCE/AUDIO
SECTION SCHEMATIC DIAGRAM

8.6. Hi-Fi AUDIO SECTION IN MAIN SCHEMATIC DIAGRAM



O MAIN SIGNAL PATH IN PLAYBACK MODE



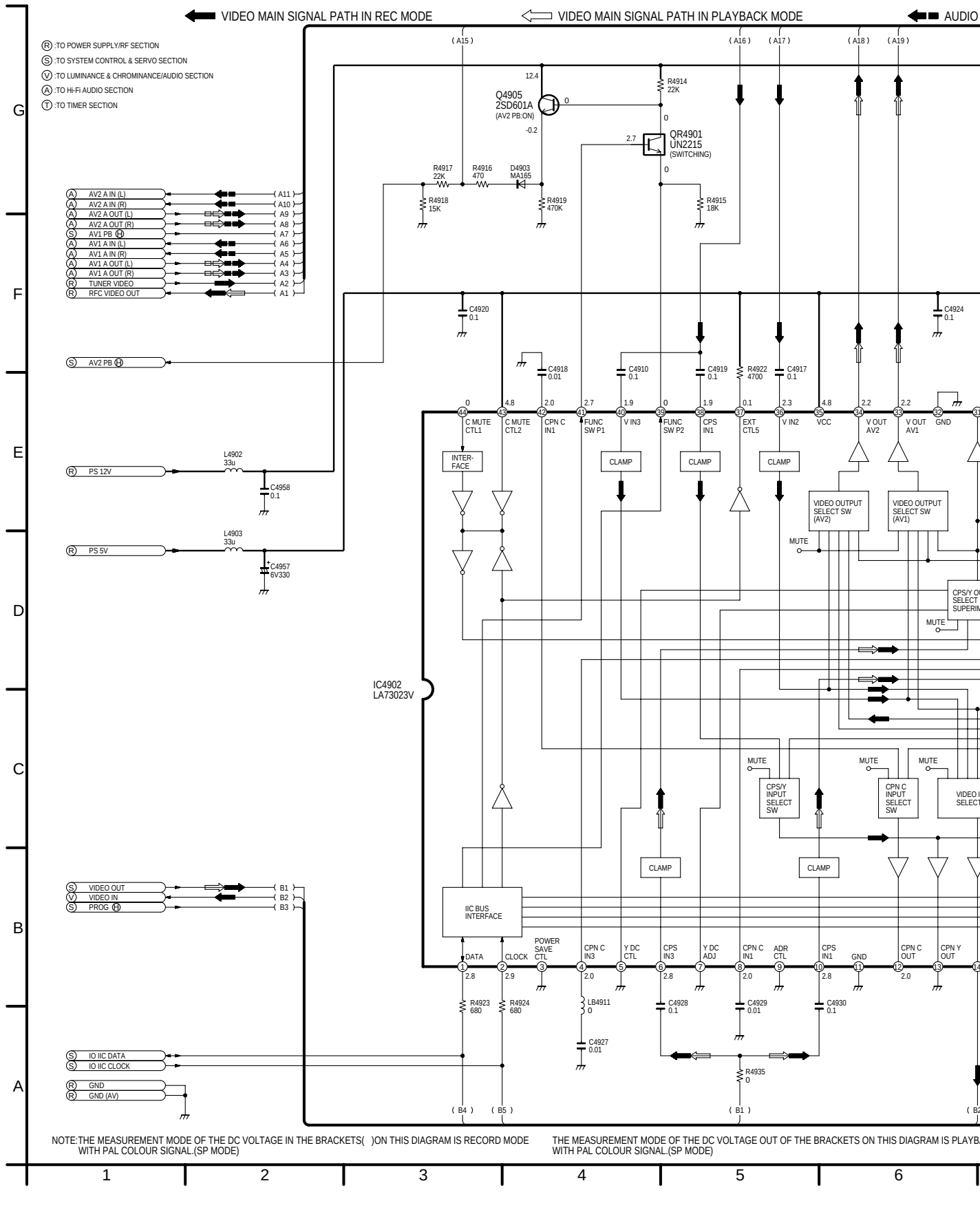
BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE

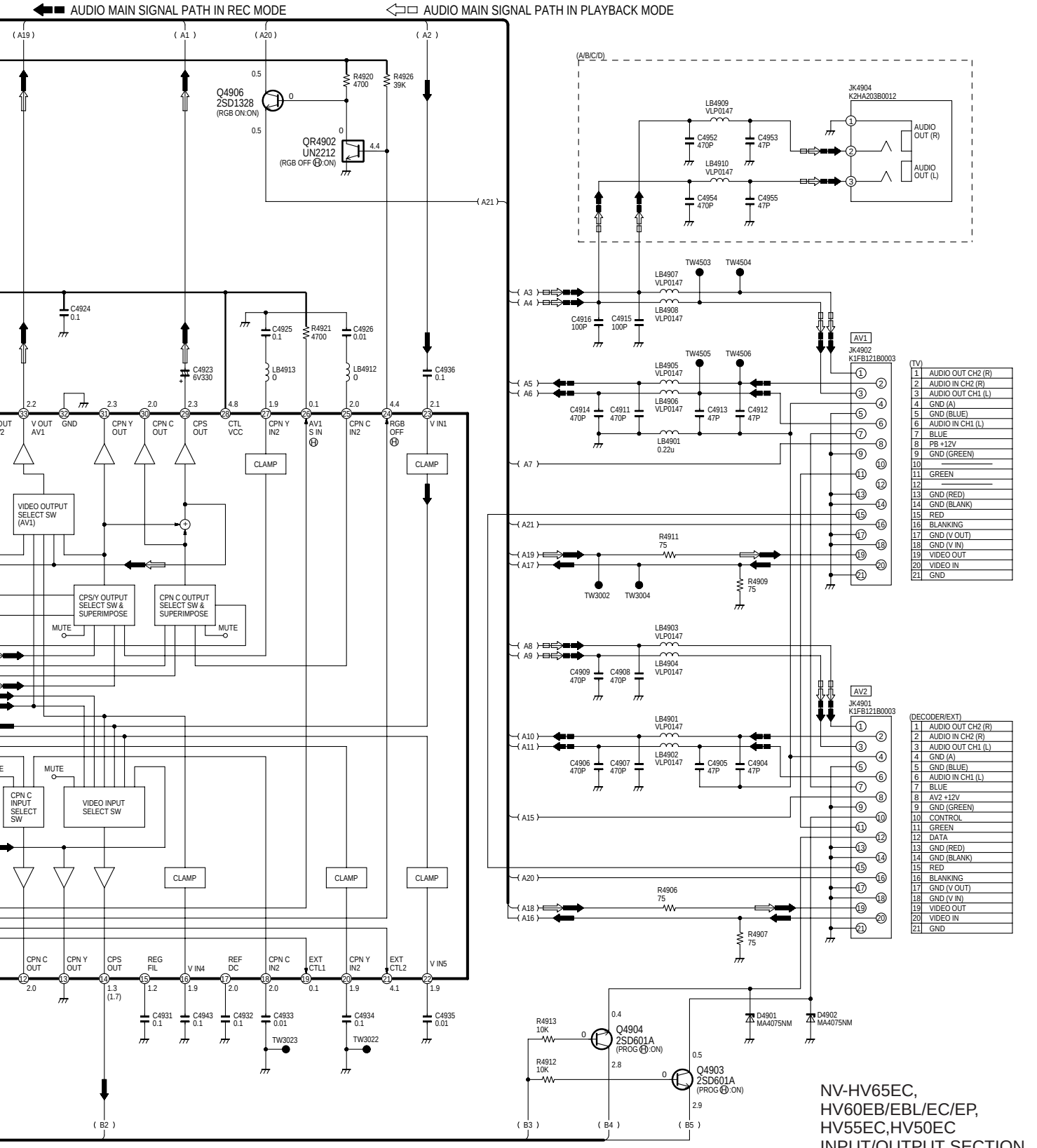
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
Hi-Fi AUDIO SECTION SCHEMATIC DIAGRAM

6 | 7 | 8 | 9 | 10

8.7. INPUT/ OUTPUT SECTION IN MAIN SCHEMATIC DIAGRAM





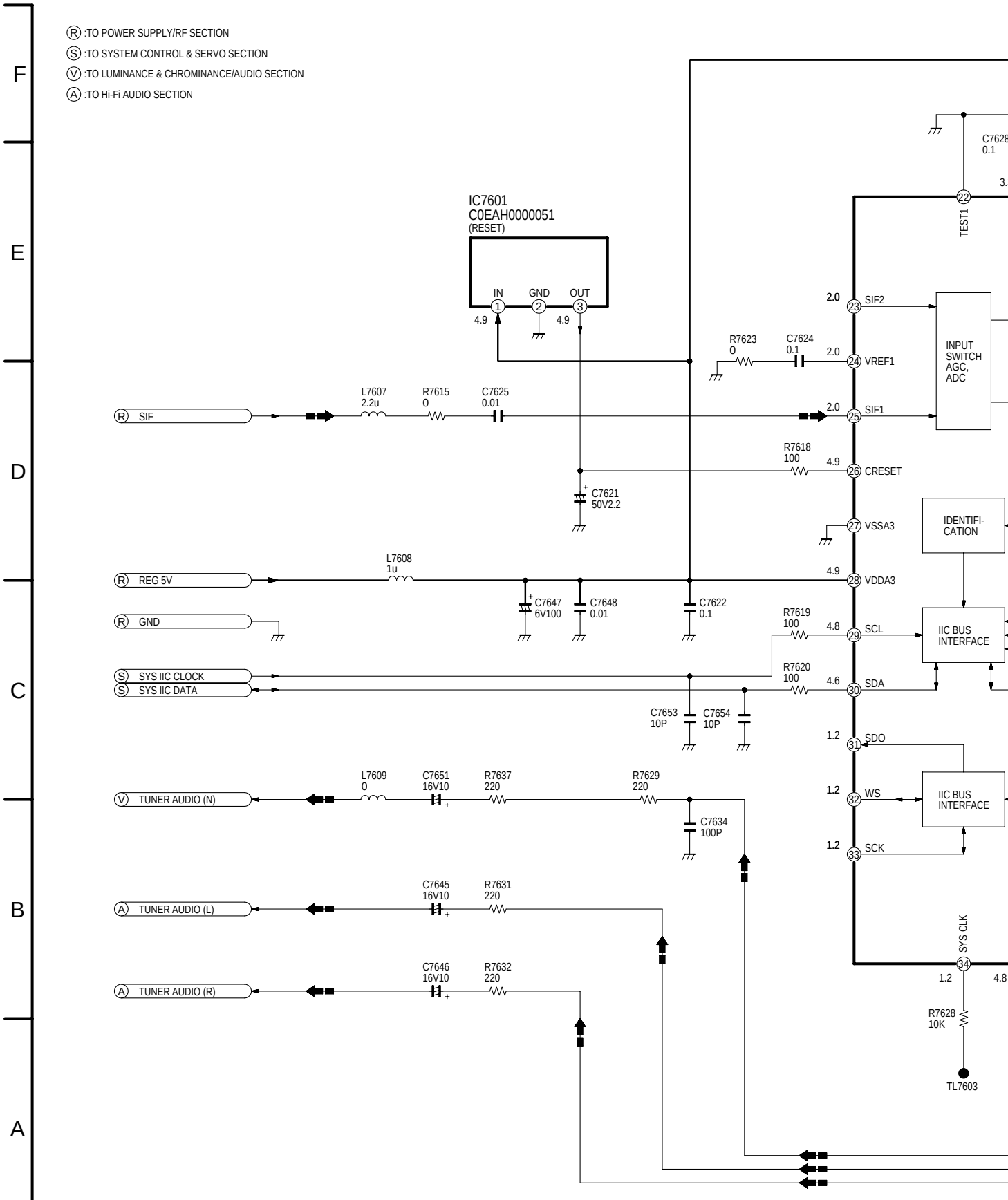
THIS DIAGRAM IS PLAYBACK MODE

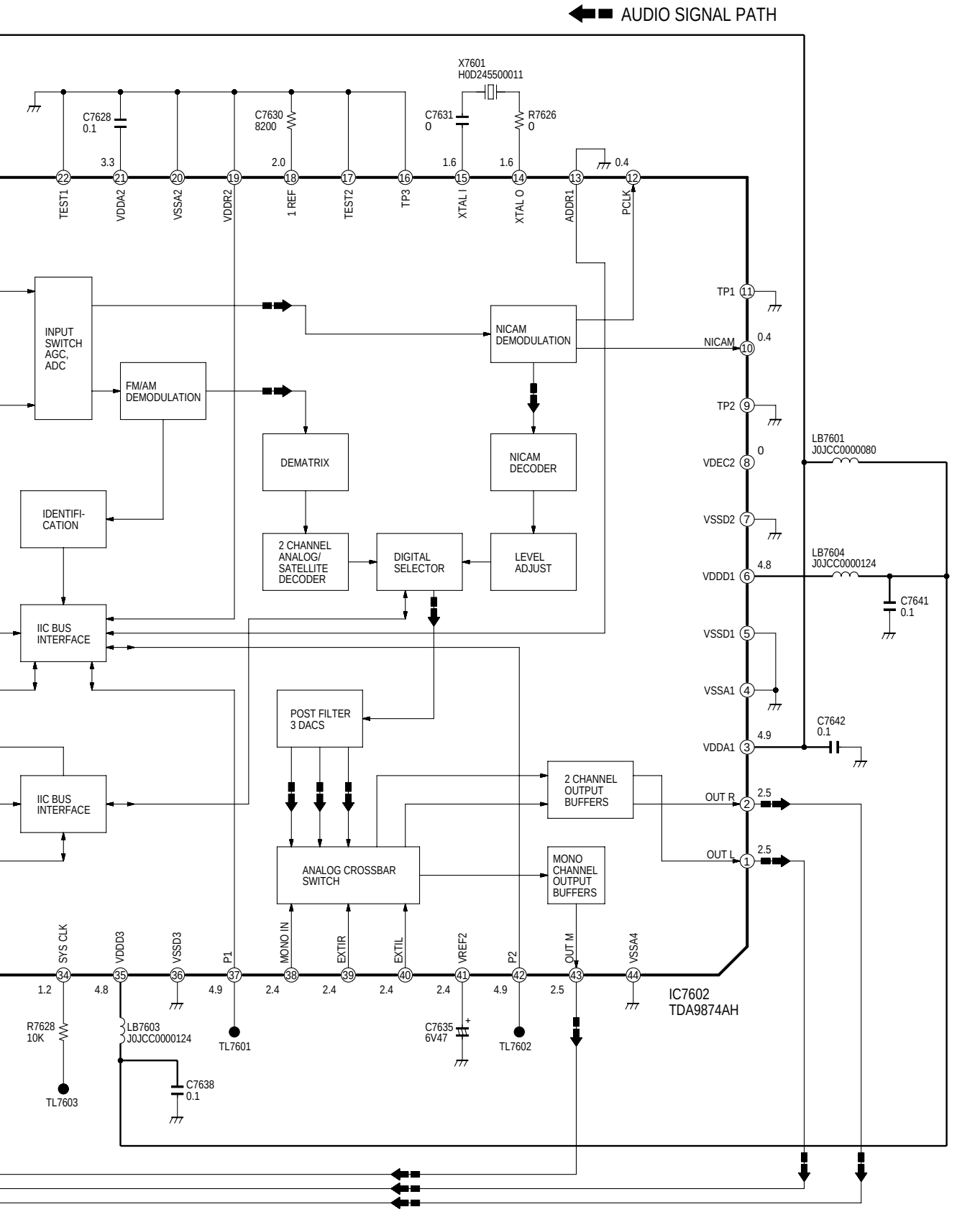
NOTE:DO NOT ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
INPUT/OUTPUT SECTION
SCHEMATIC DIAGRAM

6	7	8	9	10	11	12

8.8. DECODER SECTION IN MAIN SCHEMATIC DIAGRAM



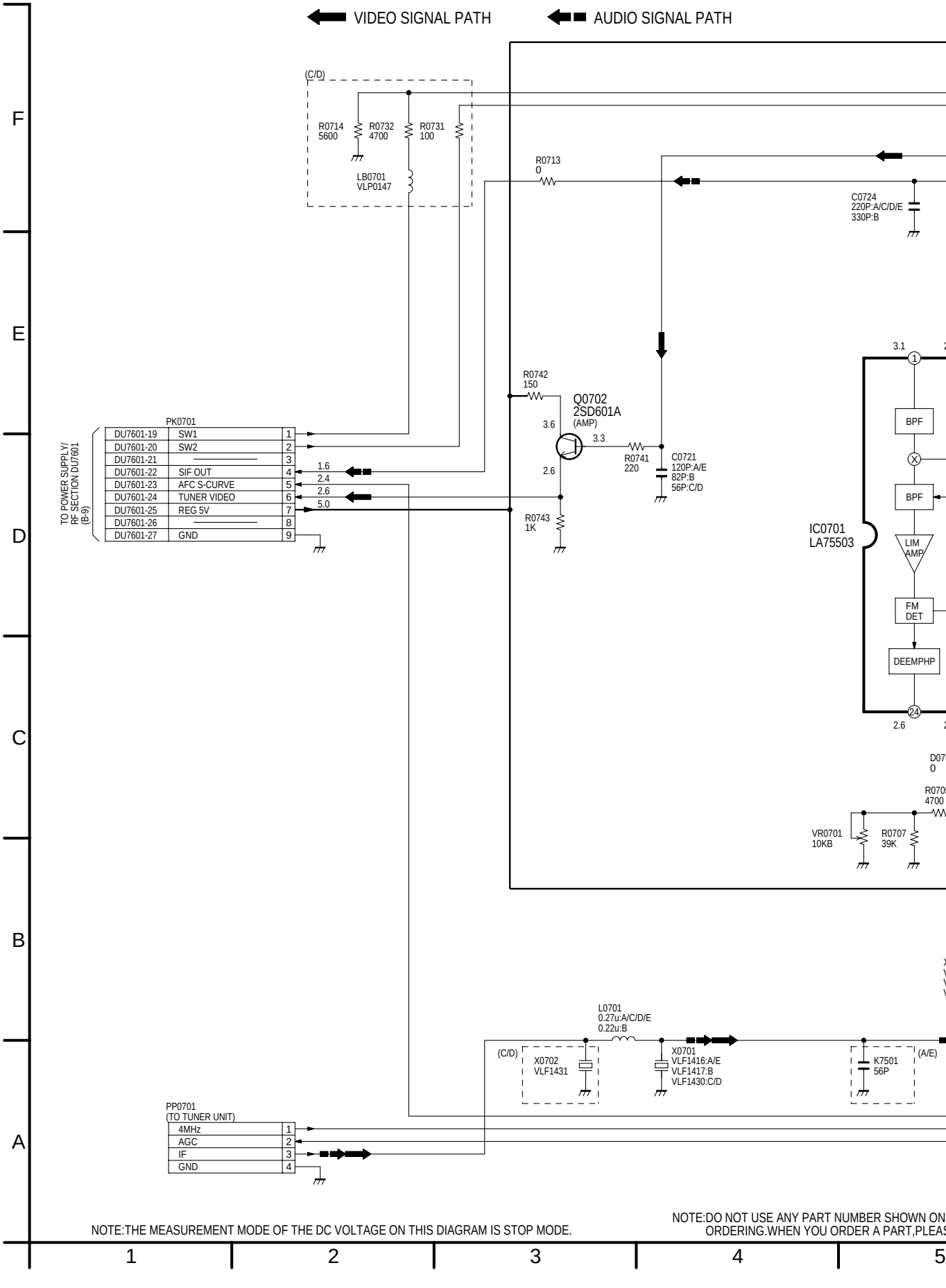


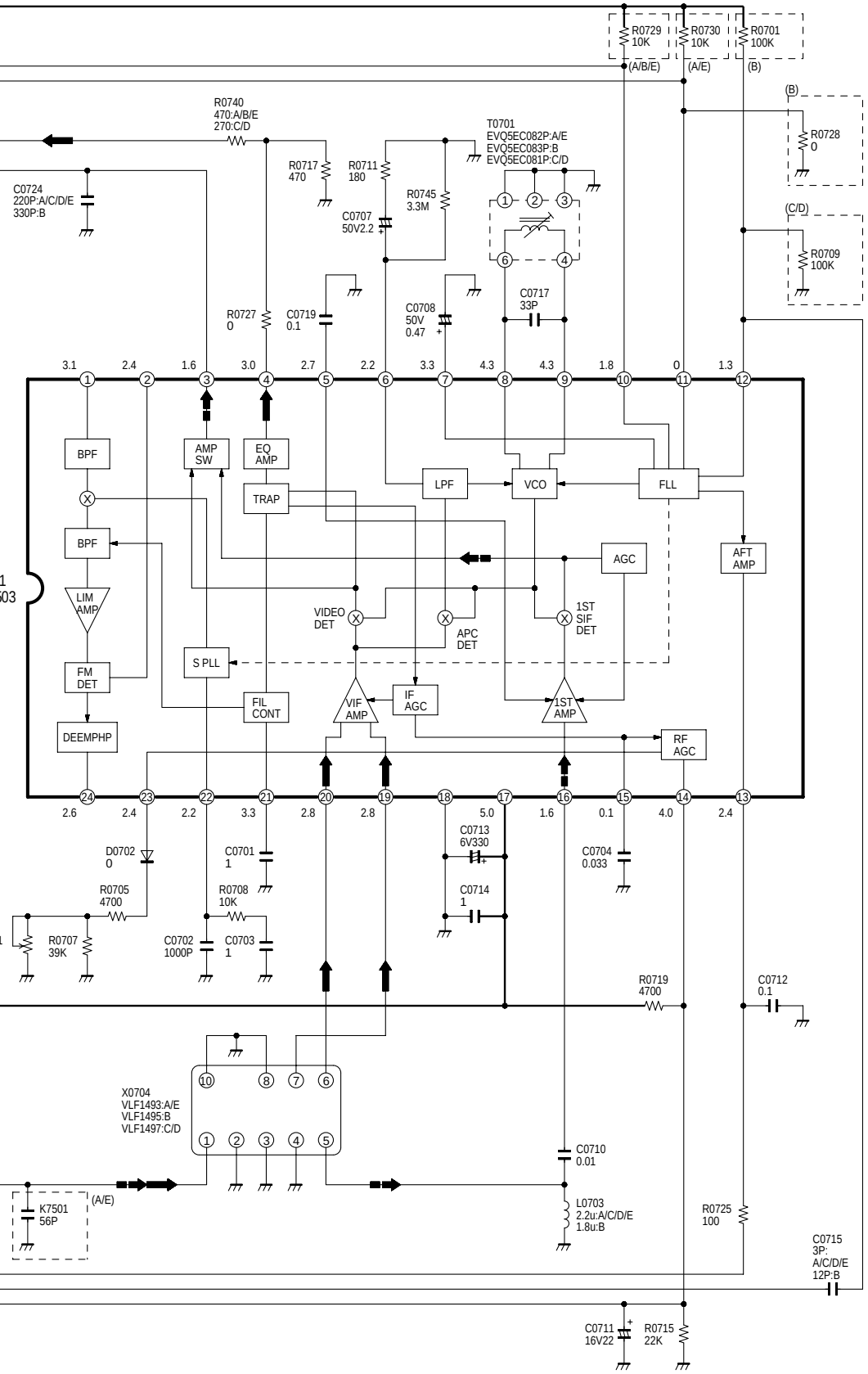
BER SHOWN ON THIS SCHEMATIC DIAGRAM FOR
R A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
DECODER SECTION SCHEMATIC DIAGRAM

5 | 6 | 7 | 8

8.9. TV DEMODULATOR PACK SCHEMATIC DIAGRAM



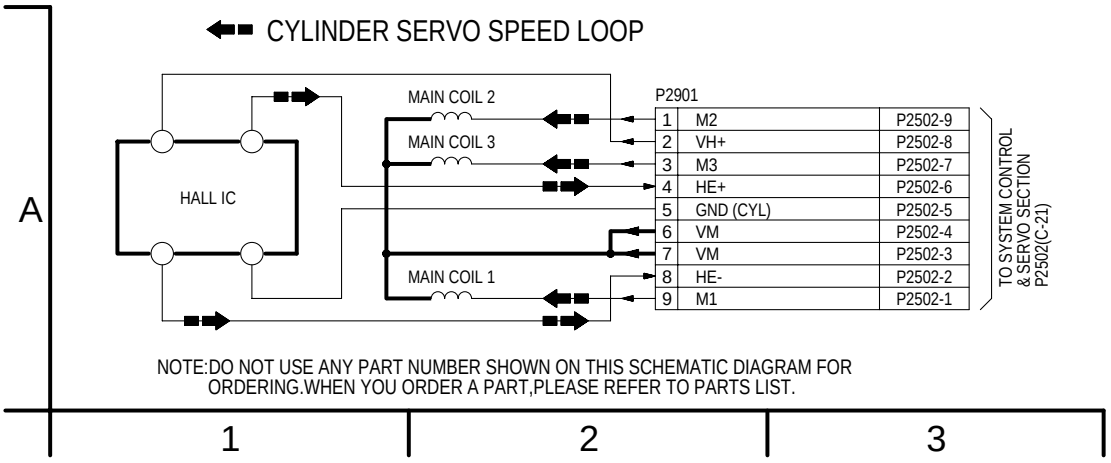


NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR
RDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
TV DEMODULATOR PACK SCHEMATIC DIAGRAM

5 6 7 8

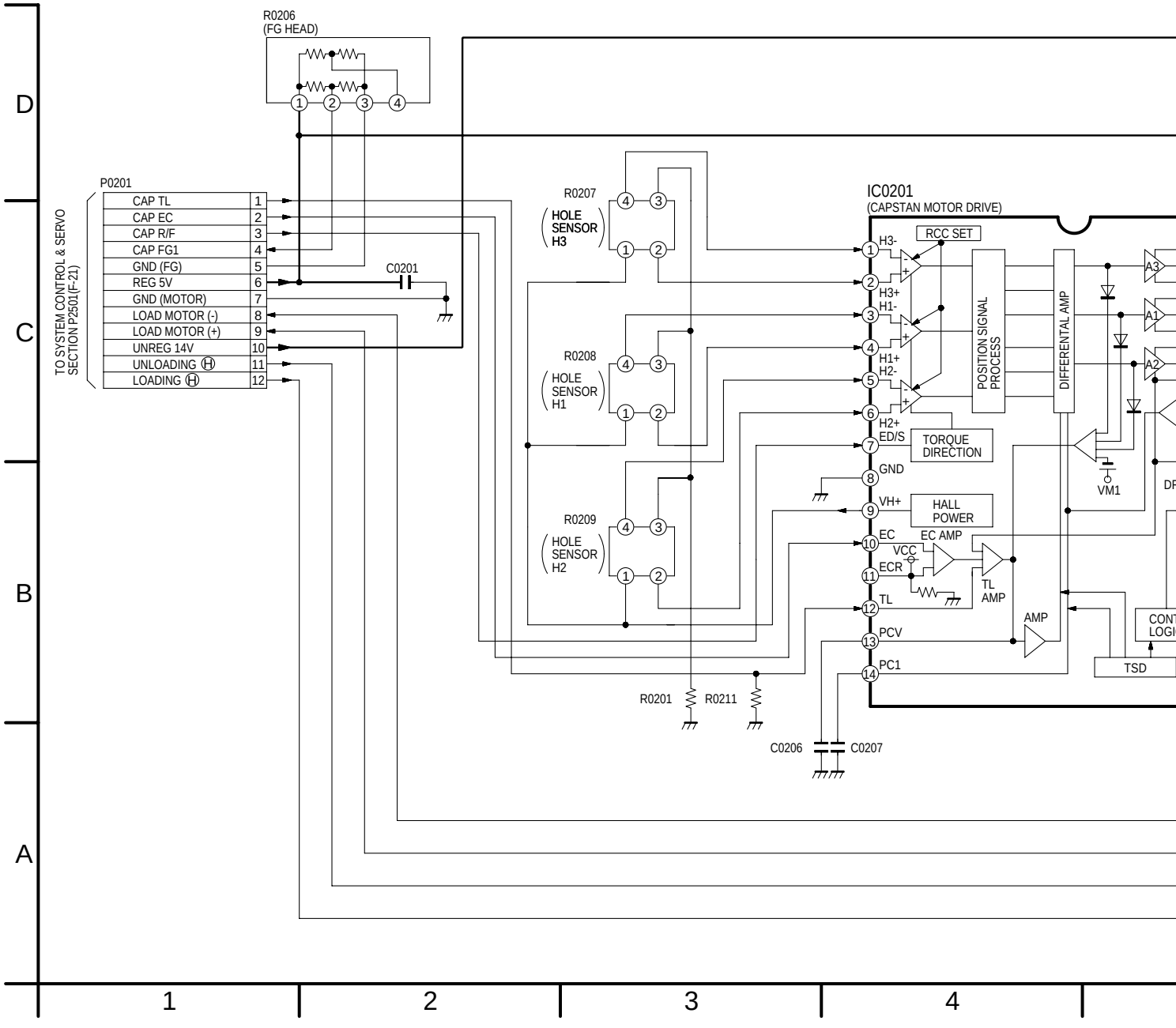
8.10. CYLINDER STATOR UNIT SCHEMATIC DIAGRAM



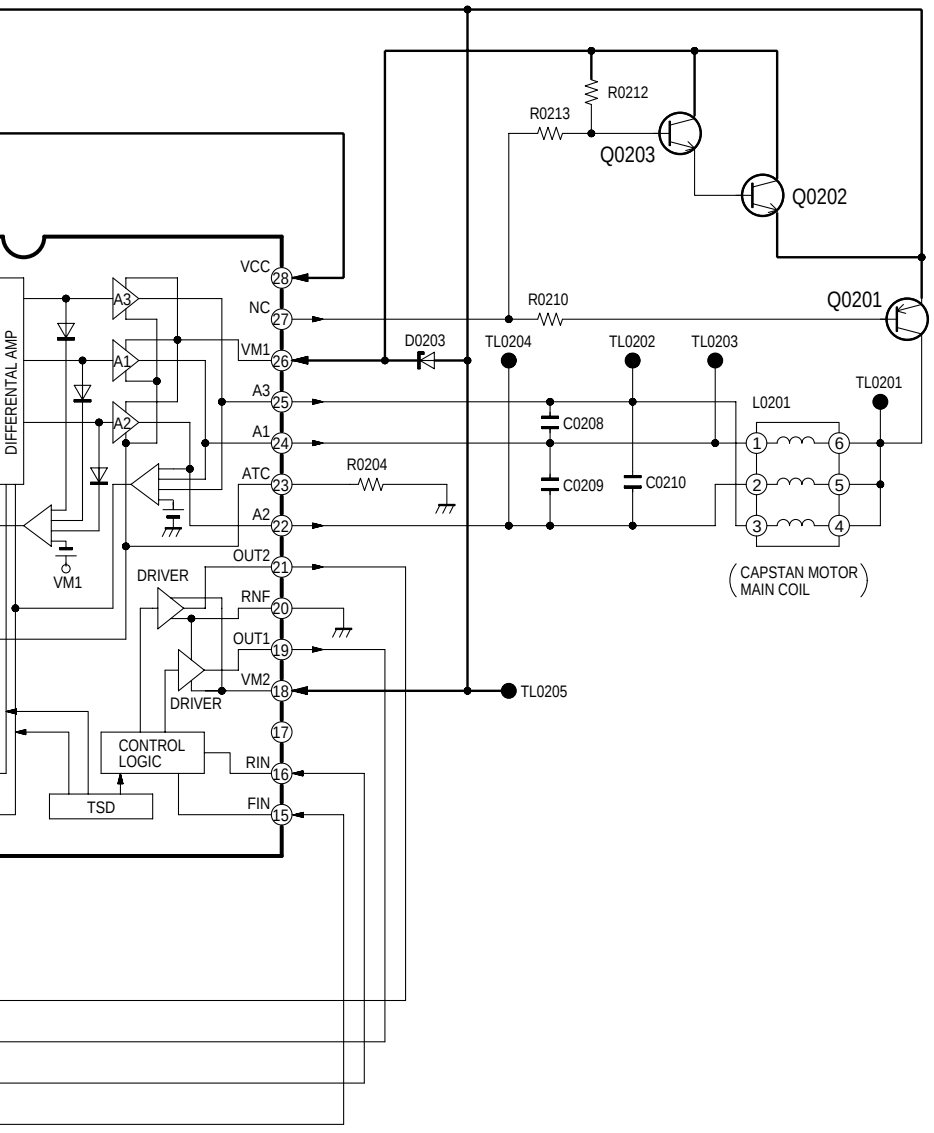
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
CYLINDER STATOR
SCHEMATIC DIAGRAM

8.11. CAPSTAN UNIT SCHEMATIC DIAGRAM



EC/EP,
DEC
TATOR
DIAGRAM



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
CAPSTAN UNIT SCHEMATIC DIAGRAM

5 | 6 | 7

T1150-3 STOP
1.6Vp-p (5msec.div.)

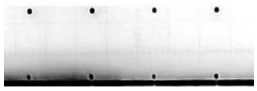
T1150-5 STOP
330Vp-p (5usec.div.)

T1150-6 STOP
340Vp-p (5usec.div.)

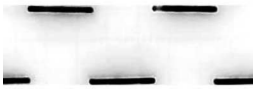
T1150-7 STOP
18Vp-p (10usec.div.)

Q1150-G STOP
15Vp-p (5usec.div.)

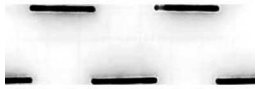
Q1200-1,2 STOP
0.5Vp-p (5usec.div.)



IC6001-13 PAUSE
5.0Vp-p (10msec.div.)



IC6001-18 REC
5.0Vp-p (10msec.div.)



IC6001-19 REC
5.0Vp-p (10msec.div.)

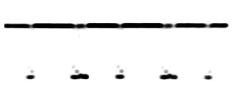
IC6001-48 REC
5.0Vp-p (10msec.div.)

IC6001-52 REC
2.1Vp-p (20µsec.div.)

IC6001-68,69 REC
5.0Vp-p (10msec.div.)

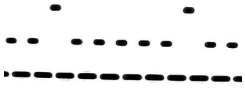
IC6001-70 REC
5.0Vp-p (10msec.div.)

IC6001-71 REC
5.0Vp-p (10msec.div.)



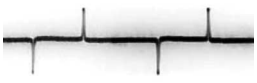
IC6001-72 REC
5.0Vp-p (10msec.div.)

IC6001-79,80 FF/REW
5.0Vp-p (1msec.div.)

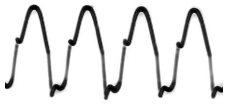


IC6001-90 REC
5.0Vp-p (10msec.div.)

IC6001-94,95 REC
6.0Vp-p (10msec.div.)



IC6001-97 PLAY
0.6Vp-p (10msec.div.)



IC2501-1,2,16 REC
9.5Vp-p (5msec.div.)

IC3001-6 REC/PLAY
1.8Vp-p (0.5msec.div.)

IC3001-15,19,21 REC
1.0Vp-p (20µsec.div.)

IC3001-26 REC
0.6Vp-p (20µsec.div.)

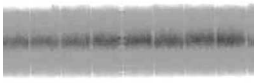
IC3001-29 REC/PLAY
2.2Vp-p (20µsec.div.)

IC3001-45,46 PLAY
0.5Vp-p (20µsec.div.)

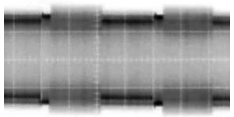
IC3001-73 REC/PLAY
5.0Vp-p (5msec.div.)

IC3001-74 REC/PLAY
5.0Vp-p (5msec.div.)

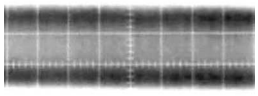
IC3001-80 REC/PLAY
0.6Vp-p (10msec.div.)



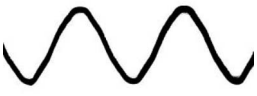
IC3001-85 PLAY
1.8Vp-p (20µsec.div.)



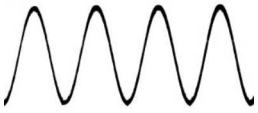
IC3001-86 REC
1.8Vp-p (5msec.div.)



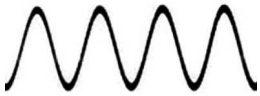
IC3001-87 PLAY
150mVp-p (20µsec.div.)



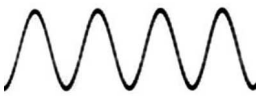
IC3001-96 PLAY
5.0Vp-p (5msec.div.)



IC3001-98 REC
2.4Vp-p (1msec.div.)



IC4501-9,14 REC
0.4Vp-p (5msec.div.)



IC4501-53,57 REC/PLAY
1.4Vp-p (0.2msec.div.)

MAIN SIGNAL PATH IN REC MODE

MAIN SIGNAL PATH IN PLAYBACK MODE

IC4501

JK4902 (AV1) TV

AUDIO OUT (R)

AUDIO IN (R)

AUDIO OUT (L)

AUDIO IN (L)

TW4504

TW4503

TW4506

TW4505

QR4504 MUTE

QR4504 MUTE

(A/B/C/D)

JK4904

AUDIO OUT (R)

AUDIO OUT (L)

JK4901 (AV2) DECODER/EXT

AUDIO OUT (R)

AUDIO IN (R)

AUDIO OUT (L)

AUDIO IN (L)

QR4503 MUTE

QR4503 MUTE

SWITCH RCH

SWITCH LCH

INPUT SELECT SWITCH RCH

INPUT SELECT SWITCH LCH

OUTPUT SELECT SWITCH RCH

OUTPUT SELECT SWITCH LCH

PNR RCH

PNR LCH

AGC & SWITCH

FM MODULATOR/ DEMODULATOR

LPF

BPF

BPF

LPF

AGC & SWITCH

IIC BUS INTERFACE

MAIN IIC CLOCK

MAIN IIC DATA

TO/FROM SYSTEM CONTROL

VCO F0

FSC

FROM LUMINANCE & CHROMINANCE

TW4511

AUDIO H.SW

FROM SYSTEM CONTROL

TO TUNER

RFC AUDIO OUT

QR4507 MUTE

FROM DECODER

TUNER AUDIO (R)

TUNER AUDIO (L)

D.FM REC (H)

FROM SYSTEM CONTROL

PREAMP & SWITCH

TW4502

TW4501

P5001 8

P5001 9

P5001 10

L

R

Hi-Fi AUDIO HEAD

AGC

IC3001

MUTE

FROM DECODER

TUNER AUDIO (N)

TO/FROM AC HEAD

A.HEAD (W)

A.HEAD (R)

P4002 4

P4002 3

REC EQ

MUTE

VCA

PRE AMP

fh TRAP

R

P

NORMAL SELECT SWITCH

MUTE CTL

MUTE CTL

MUTE (H)

FROM SYSTEM CONTROL

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
AUDIO BLOCK DIAGRAM

IC0201 (CAPSTAN MOTOR DRIVE)

CAPSTAN MOTOR

TL0201

MOTOR DRIVE

DIFFERENTIAL AMPRIFIER

TORQUE CONTROL

TL AMP

HALF WAVE TL AMP

EC AMP

POSITION SIGNAL PROCESS

TORQUE DIRECTION

CONTROL LOGIC

H1

H2

H3

LOADING MOTOR

INPUT		OUTPUT		MODE
PIN 15	PIN 16	PIN 19	PIN 21	
H	L	H	L	FORWARD
L	H	L	H	REWIND
H	H	L	L	BRAKE
L	L	OPEN	OPEN	STOP

CAPSTAN FG HEAD

CAP FG5V

TW2015

IC6001 (SYSTEM CONTROL/SERVO IC)

TL2503

TL2502

P0201 P2501 1 — CURRENT LIMIT

P0201 P2501 2 — CAPSTAN ERROR TORQUE

P0201 P2501 3 — CAPSTAN REVERSE/ FORWARD

UNREG 14.5V

HALF WAVE (H)

P1501 1 / P1501 2 — P2501 P0201 9 / P2501 P0201 8

P0201 P2501 12 — LOADING (H)

P0201 P2501 11 — UNLOADING (H)

P0201 P2501 4 — CAPSTAN FG IN

CAPSTAN FG OUT

TW6002

125Hz

S1501 MODE SW

POSITION SW2

POSITION SW3

POSITION SW1

PS 12V

Q6008

QR6001

FROM INPUT/ OUTPUT

AV1 PB (H)

AV1 PB (H)

AVPB (H)

AVPB (M)

TW2002

PB CTL OUT

EX.FF/REW (L)

CYL PFG

CYLINDER STATOR UNIT

P2901

MAIN COIL 2	6,7	VM	P2502-3,4
MAIN COIL 1	1	M2	P2502-9
MAIN COIL 3	9	M1	P2502-1
	3	M3	P2502-7
	5	GND	P2502-5
	8	HE-	P2502-2
	4	HE+	P2502-6
	2	VH+	P2502-8

HALL IC

REG 5V

IC2501 (CYLINDER MOTOR DRIVE)

COM

MOTOR DRIVE

PG/FG

DIFFERENTIAL AMPLIFIER

SCHMIT

TORQUE CONTROL

REG 5V

CYLINDER ERROR TORQUE

TAKE-UP PHOTO

SUPPLY PHOTO

SAFETY TAB (L)

REG 5V

IC1502 (S-REEL SENSOR)

IC1501 (T-REEL SENSOR)

REG 5V

TL6012

TL6013

T-REEL PULSE

S-REEL PULSE

Q1501 TAKE UP PHOTO SENSOR

D1501 SENSOR LED

Q1502 SUPPLY PHOTO SENSOR

S7507 SAFETY TAB SW

CTL HEAD

P4002 5 / P4002 6

CTL HEAD(-)

CTL HEAD(+)

IC7501

RESET

N.SW 5V

P.FAIL (L)

IC7502

IR RECEIVER

N.SW 5V

IR

IC7503

RESET

C7507

RESET (L)

BACK UP 5V

12M START (H)

N.SW 5V

FIP ON (L)

QR1003

12MHz IN

12MHz OUT

X6001

32KHz IN

32KHz OUT

X6002

IIC CLOCK

IIC DATA

FLD CS

S.CLOCK

S.DATA OUT

S.DATA IN

IC6002 (EEPROM)

SCL

SDA

IIC CLOCK

IIC DATA

TO/FROM LUMI.& CHRO, Hi-Fi AUDIO, INPUT/OUTPUT, DECODER,TUNER

DP7501

TIMER DISPLAY

F+

F-

Q1001

BUFFER

FROM POWER

HEATER(+)

HEATER(-)

UNREG -29V

QR1002

IC7501

SEG1

SEG18

GRID1

GRID7

VEE

CS

SERIAL CLOCK

SERIAL DATA

AN2

AN1

AN0

N.SW 5V

POWER KEY

POWER S7506

TIMER CHECK S7517

INTELLIGENT TIMER S7510

PROG PLAY S7516

EJECT S7505

EXT LINK S7508

FF S7514

T.REC S7513

STOP S7515

REC S7501

CH DOWN S7502

REW S7512

PLAY S7511

QUICK ERASE S7503

CH UP S7504

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
SYSTEM CONTROL & SERVO BLOCK DIAGRAM

VIDEO MAIN SIGNAL PATH IN REC MODE

VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE

IC4902
(INPUT/OUTPUT SELECT)

IIC BUS INTERFACE

DATA 1

CLOCK 2

CPN Y IN1 10

CLAMP

CPS OUT 29

CPN Y IN3 6

CLAMP

TW3004

V IN2 36

CLAMP

TW3002

V OUT AV1 33

V OUT AV2 34

CPN Y IN1 38

CLAMP

V IN3 40

CLAMP

V IN1 23

CLAMP

CPS OUT 14

JK4902
AV1(TV)

19 VIDEO OUT

20 VIDEO IN

JK4901
AV2
(DECODER)

19 VIDEO OUT

20 VIDEO IN

TUNER/
TV DEMODULATOR

6 RFC VIDEO OUT

24 TUNER VIDEO

IC6001

OSD SIGNAL PROCESS

52

50

72 IIC DATA

71 IIC CLOCK

59

(D)

L6002, C6006

BPF

Q6003

BUFFER

IC6003
(OSD u-COM SLICER)

5 SDA

4 SCL

VCBS 17

Q6004

AMP

(A/B/C/D)

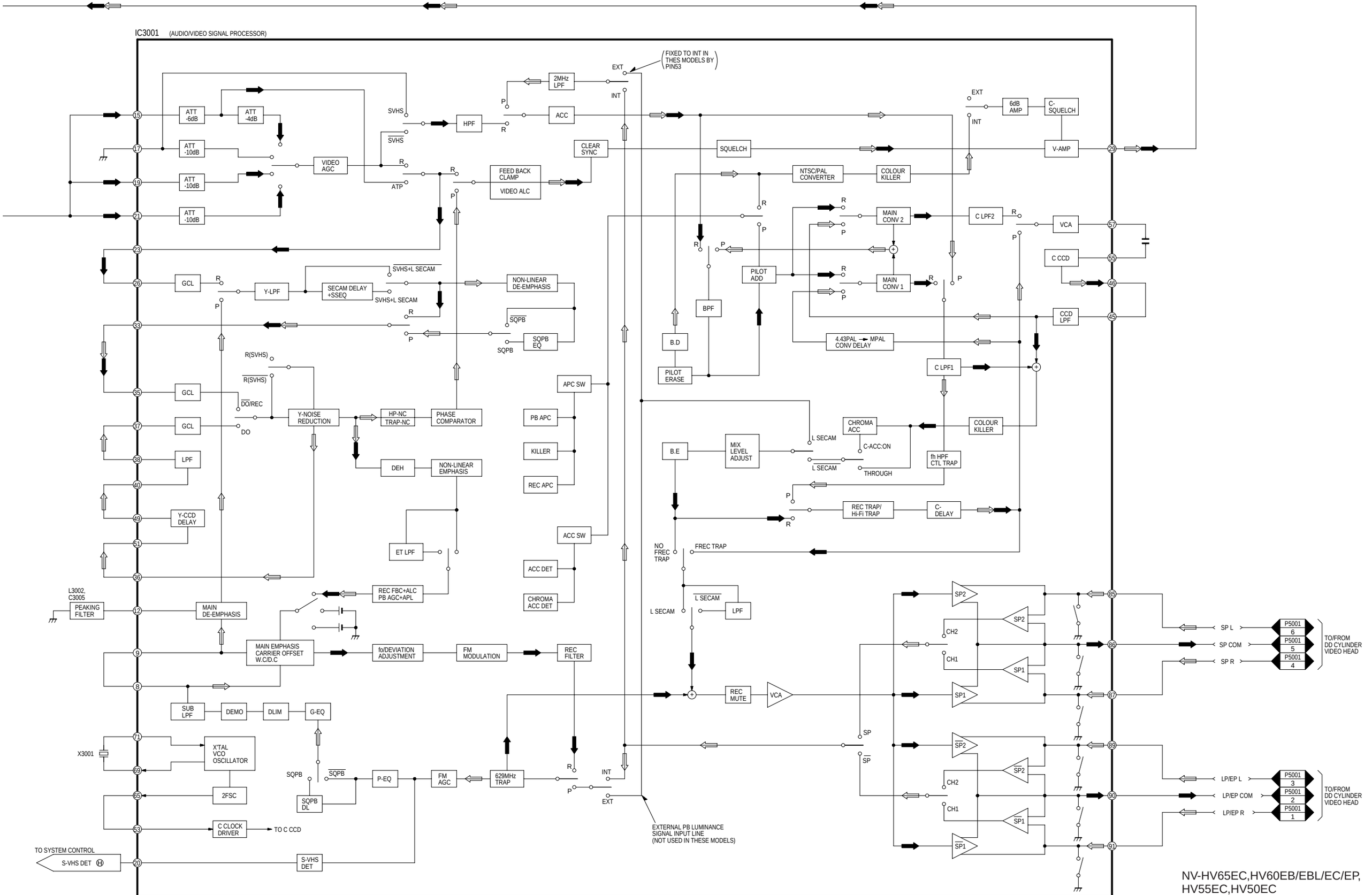
Q6009

BUFFER

VIDEO OUT

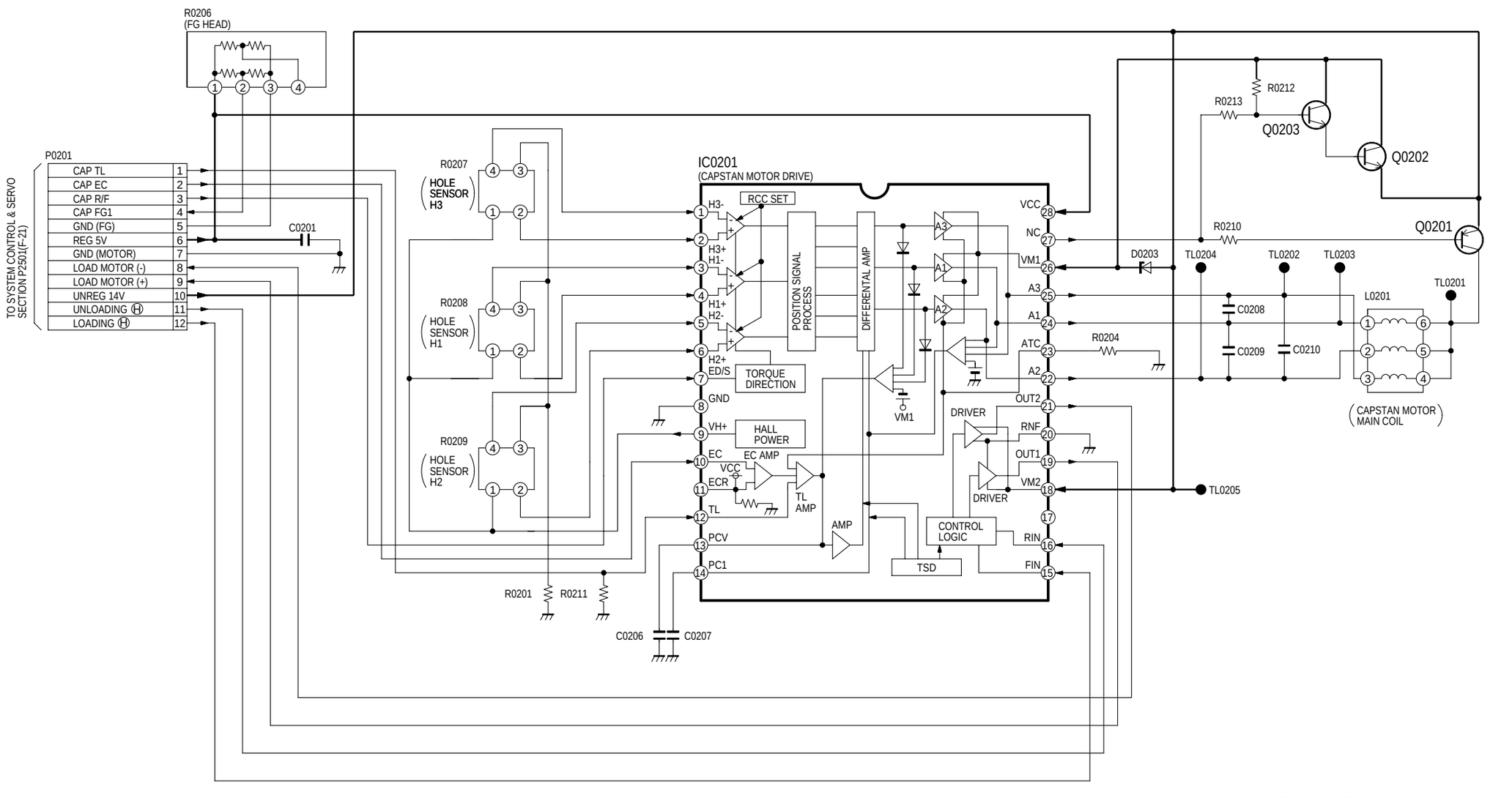
VIDEO IN

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
LUMINANCE & CHROMINANCE BLOCK DIAGRAM

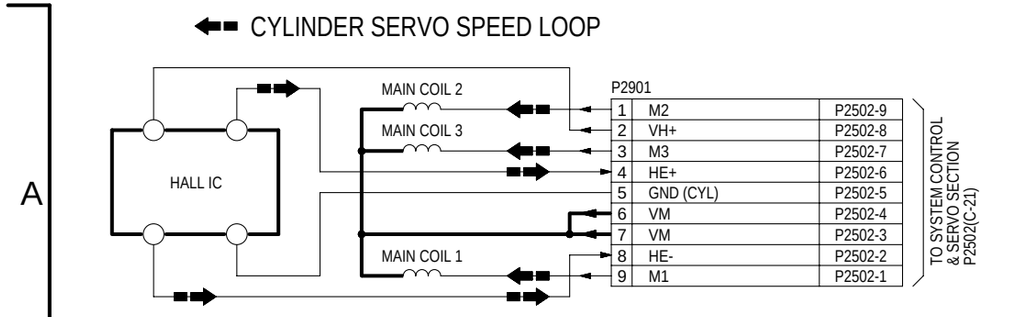


NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
LUMINANCE & CHROMINANCE BLOCK DIAGRAM

NV-HV65EC,HV60EB/EBL/EC/EP,
HV55EC,HV50EC
LUMINANCE & CHROMINANCE
BLOCK DIAGRAM



NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
CAPSTAN UNIT SCHEMATIC DIAGRAM



NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,
HV60EB/EBL/EC/EP,
HV55EC,HV50EC
CYLINDER STATOR
SCHEMATIC DIAGRAM

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
Ⓐ :TO Hi-Fi AUDIO SECTION

AUDIO SIGNAL PATH

IC7601
C0EAH0000051
(RESET)
IN GND OUT
4.9 4.9

X7601
H0D245500011

C7628 0.1
C7630 8200
C7631 0
R7626 0

TEST1 VDDA2 VSSA2 VDDR2 1 REF TEST2 TP3 XTAL I XTAL O ADDR1 PCLK

R7623 0
C7624 0.1
L7607 2.2u
R7615 0
C7625 0.01
R7618 100
C7621 50V2.2
L7608 1u
C7647 6V100
C7648 0.01
C7622 0.1
R7619 100
R7620 100
C7653 10P
C7654 10P
L7609 0
C7651 16V10
R7637 220
R7629 220
C7634 100P
C7645 16V10
R7631 220
C7646 16V10
R7632 220

Ⓡ SIF
Ⓡ REG 5V
Ⓡ GND
Ⓢ SYS IIC CLOCK
Ⓢ SYS IIC DATA
Ⓥ TUNER AUDIO (N)
Ⓐ TUNER AUDIO (L)
Ⓐ TUNER AUDIO (R)

SIF2 VREF1 SIF1 CRESET VSSA3 VDDA3 SCL SDA SDO WS SCK

INPUT SWITCH AGC, ADC
FM/AM DEMODULATION
IDENTIFI-CATION
IIC BUS INTERFACE
IIC BUS INTERFACE
NICAM DEMODULATION
DEMATRIX
NICAM DECODER
2 CHANNEL ANALOG/ SATELLITE DECODER
DIGITAL SELECTOR
LEVEL ADJUST
POST FILTER 3 DACS
ANALOG CROSSBAR SWITCH
2 CHANNEL OUTPUT BUFFERS
MONO CHANNEL OUTPUT BUFFERS

TP1 NICAM TP2 VDEC2 VSSD2 VDDD1 VSSD1 VSSA1 VDDA1 OUT R OUT L

LB7601 J0JCC0000080
LB7604 J0JCC0000124
C7641 0.1
C7642 0.1

SYS CLK VDDD3 VSSD3 P1 MONO IN EXTIR EXTIL VREF2 P2 OUT M VSSA4

R7628 10K
LB7603 J0JCC0000124
C7638 0.1
C7635 6V47
TL7601
TL7602
TL7603

IC7602
TDA9874AH

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

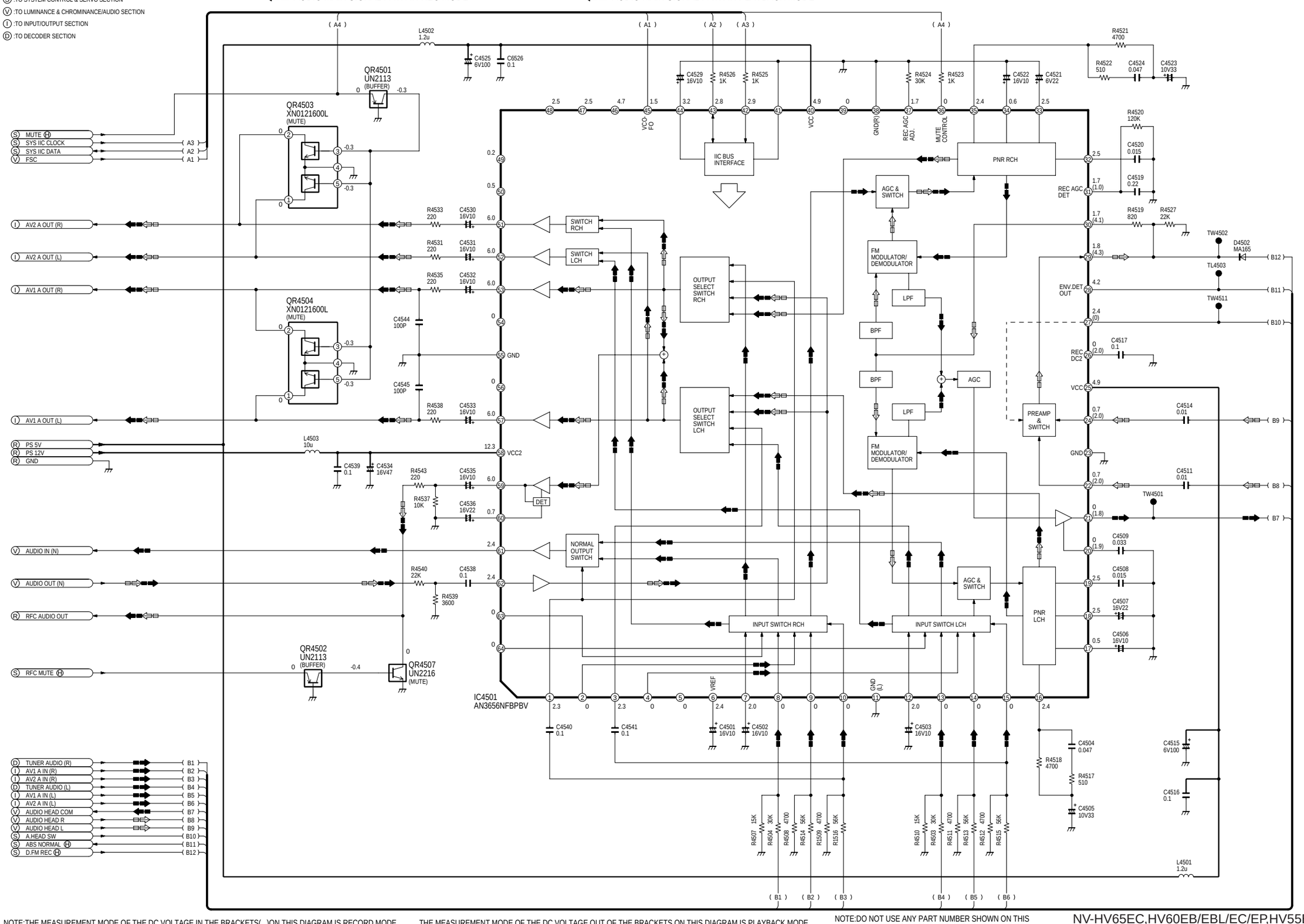
NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
DECODER SECTION SCHEMATIC DIAGRAM

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓓ :TO DECODER SECTION

AUDIO MAIN SIGNAL PATH IN REC MODE

AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE



NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS( )ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.(SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.(SP MODE)

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC,HV60EB/EBL/EC/EP,HV55EC,HV50EC
Hi-Fi AUDIO SECTION SCHEMATIC DIAGRAM

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

(R) :TO POWER SUPPLY/RF SECTION
(S) :TO SYSTEM CONTROL & SERVO SECTION
(V) :TO LUMINANCE & CHROMINANCE/AUDIO SECTION
(A) :TO Hi-Fi AUDIO SECTION
(T) :TO TIMER SECTION

IC4902
LA73023V

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS( )ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.(SP MODE)

THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.(SP MODE)

NOTE:DO NOT ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC, HV60EB/EBL/EC/EP, HV55EC,HV50EC INPUT/OUTPUT SECTION SCHEMATIC DIAGRAM

CAUTION THE STRIPED FRAME INDICATES THE PRIMARY CIRCUIT TO DISTINGUISH THE PRIMARY FROM THE SECONDARY CIRCUIT.
PAY ATTENTION NOT TO RECEIVE AN ELECTRIC SHOCK DURING REPAIR AND SERVICE OF THE PRODUCTS.

HOT

Ⓡ :TO POWER SUPPLY/RF SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓣ :TO TIMER SECTION

P1101 VJS4121 AC INLET
F1101 VSF0243C16
D1110 ERZVA5V471
L1121 ELF15N005A
L1120 ELF15N003A
C1121 1000P
C1120 0.068
D1140 DF08S-6622
C1141 400V33
R1150 1M
R1154 1M
T1150 ETS29AZ286AC

HEATER DC(-) RⓉ
C1280 10V100
D1280 11EQS04
HEATER DC(+) R
D1270 MA185
C1270 50V22
UNREG -29V R
D1250 ERA85-009V5
D1251 ERA85-009V5
L1250 22u
C1250 25V680
C1251 25V100
R1200 39K
R1207 33K
UNREG 14V RⓈ
D1263 21DQ04FC4
L1260 22u
C1260 10V1000
C1261 10V330
UNREG 6V R
D1230 MA185
C1230 50V22
D1180 MA7510
UNREG 36V R
GND R
TO BOTTOM PLATE

Q1153 2SK2876 (VOLTAGE CONTROL)
R1162 1K
R1163 100
C1155 270P
C1210 3300P
LR1150 VLP0392
LB1213 J0JHC0000070
C1123 1000P
Q1150 FS4KM-12A-AS (VOLTAGE CONTROL)
C1154 0.022
R1153 330
R1155 100K
D1150 AU01ZV2
R1161 100
Q1152 2SC3311A (VOLTAGE CONTROL)
R1160 0.51 (1W)
Q1151 2SD1992A (VOLTAGE CONTROL)
R1157 1800
D1157 MA4027L
D1152 MA185
C1151 0.047
D1155 MA165
C1153 0.1
R1156 33
R1159 3.3
R1158 330
C1152 0.01
Q1200 PC123ZY2
IC1200 uPC1093J
R1205 2200
R1206 270
C1200 0.1
R1204 12K
R1203 33K
R1208 8200
R1209 56K
R1202 2200

NOTE1:WHEN MEASURE THE VOLTAGE OR WAVEFORM ON THE POWER TRANSFORMER CIRCUIT,SET THE GND TERMINAL OF MEASURING POINT AS FOLLOWS.
PRIMARY SIDE..... ⏚
SECONDARY SIDE... ⏚
NOTE2:THE DC VOLTAGE INDICATED IN PRIMARY SIDE IS SHOWN THE VOLTAGE WHEN INPUT AC IS 240V.

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.
NOTE:THE MEASURMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NV-HV65EC, HV60EB/EBL/EC/EP, HV55EC,HV50EC POWER TRANSFORMER SECTION SCHEMATIC DIAGRAM

Ⓟ :TO POWER TRANSFORMER SECTION
Ⓢ :TO SYSTEM CONTROL & SERVO SECTION
Ⓥ :TO LUMINANCE & CHROMINANCE/AUDEIO SECTION
Ⓐ :TO Hi-Fi AUDIO SECTION
Ⓘ :TO INPUT/OUTPUT SECTION
Ⓣ :TO TIMER SECTION
Ⓓ :TO DECODER SECTION

VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
AUDIO MAIN SIGNAL PATH IN REC MODE
AUDIO MAIN SIGNAL PATH IN PLAYBACK MODE

Q1013 2SD601A (FIP ON/OFF CONTROL)
Q1003 2SB710A (POWER SAVE CONTROL)
QR1003 UN2112 (FIP Ⓛ :ON)
QR1004 UN2111 (POWER ON/OFF CONTROL)
QR1005 UN2211 (POWER ON:ON)
Q1001 2SD602A (BUFFER)
Q1005 2SC1959Y (12V REG.)
Q1009 2SC1959Y (5V REG.)
Q1008 2SC1959Y (5V REG.)
Q1007 2SC1959Y (5V REG.)
Q1002 2SC1959Y (5V REG.)
Q1006 2SC1959Y (5V REG.)

TUNER UNIT
TU7601
ENG47327G1:A/E
ENG47328G1:B
ENG47329G1:C/D

1 N.SW 5V
2 AUDIO OUT
3 DATA
4 PS 5V
5 CLOCK
6 VIDEO OUT
7
8 AGC
9 BT
10
11 CLOCK
12 DATA
13
14 REG 5V
15 SW1
16 BTL 30V
17 IF OUT
18 IF IN

P UNREG -29V
S FIP Ⓛ
T FIP -29V
S SLEEP Ⓗ
P UNREG 36V
P UNREG 14V
P UNREG 6V
P HEATER DC (+)
P HEATER DC (-)
P GND
S V A GND
I T D GND
S V A T GND (SYS)
S T GND (FIP)
S GND (CTL)
S GND (FG)
S GND (MOTOR)
V A GND (A)
V A GND (HA)
V GND (V)
V GND (NA)
I GND (AV)
T HEATER (+)
S POWER OFF Ⓛ
S D REG 5V
V VIDEO 5V
S A I PS 12V
S V A I PS 5V
V BIAS 5V
S T N.SW 5V
A RFC AUDIO OUT A1
I RFC VIDEO OUT A2
S SYS IIC CLOCK A3
S SYS IIC DATA A4
S SW2 A5
D SIF A6
S AFC S-CURVE A7
I TUNER VIDEO A8

A1 R7603 0
A2 R7606 100
A3 R7605 100
A4 R7608 100
A5 R7607 100
A6
A7
A8
L7603 27u
C7611 33P
C7612 0.1
C7609 33P
C7610 33P
R7614 150
R7613 150
C7607 50V1
D7601 MA4300M
(C/D)
C7619 0.1
K7611 J0JBC0000041
(A/C/D/E)
C7617 0.01

L7601 27u
L7602 27u
L7605 2.2u
L7606 0
C7603 6V100
C7605 0.01
C7604 6V100
C7614 6V100
C7615 0.01
R7612 330
R7611 330

DU7601

19	SW1	PK0701-1
20	SW2	PK0701-2
21	——	PK0701-3
22	SIF	PK0701-4
23	AFC S-CURVE	PK0701-5
24	TUNER VIDEO	PK0701-6
25	REG 5V	PK0701-7
26	——	PK0701-8
27	GND	PK0701-9

TO TV DEMODULATOR PACK PK0701(D-1)

R1024 5600
R1006 5600
R1005 5600
R1001 33K
R1014 4700
R1016 10K
R1027 3300
R1028 3300
R1013 10K
R1015 10K
R1022 150
R1025 150
R1008 470
R1009 470
C1026 0.1
R1003 27K
R1026 6800
C1025 0.1
C1008 0.1
C1004 25V47
D1003 MA4130NL
C1019 0.1
C1018 0.1
C1016 16V100
D1011 MA4051NM
D1012 MA165
C1003 0.1
C1002 25V47
D1002 MA4056NH
C1009 0.1
C1011 25V47
D1005 MA4056NH

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED WITH THE MARK ⚠ HAVE THE SPECIAL CHARACTERISTICS FOR SAFETY.
WHEN REPLACING ANY OF THESE COMPONENTS,USE ONLY THE SAME TYPE.

NOTE:THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS STOP MODE.

NOTE:DO NOT USE ANY PART NUMBER SHOWN ON THIS SCHEMATIC DIAGRAM FOR ORDERING.WHEN YOU ORDER A PART,PLEASE REFER TO PARTS LIST.

NV-HV65EC, HV60EB/EBL/EC/EP, HV55EC,HV50EC POWER SUPPLY/RF SECTION SCHEMATIC DIAGRAM

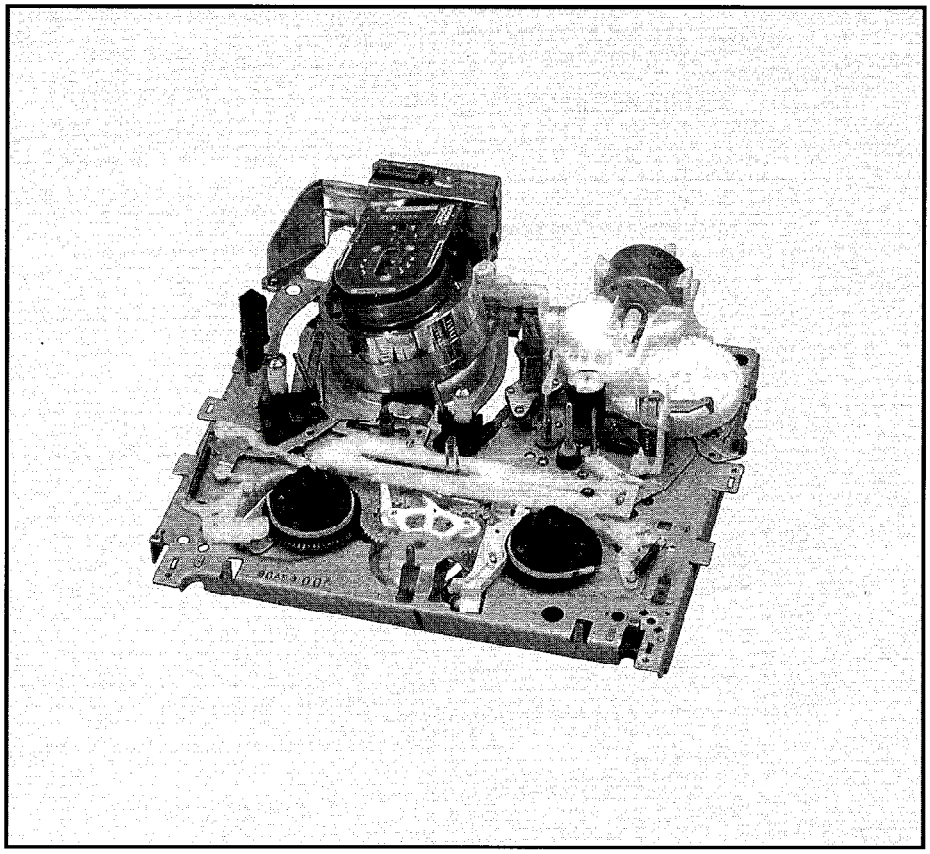
ORDER NO. VRD9612M129

Service Manual

Video Cassette Recorder

Panasonic VHS

Z-MECHANISM CHASSIS



INTRODUCTION

The Z-Mechanism chassis are built in several Panasonic VHS Video Cassette Recorders from NV-SD series in 1996.

⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

Panasonic

© 1996 Matsushita Electric Industrial Co., Ltd.
All rights reserved. Unauthorized copying and distribution is a violation of law.

CONTENTS

1. OUTLINE OF Z MECHANISM 1
   1-1. The tape transport path 1
   1-2. Cassette holder unit 2
   1-3. Reel brake 2
   1-4. Number of Gear Phase Alignment Point and Replacement Parts 3
   Z Mechanism Components 4
   FLOW CHART OF LOADING MECHANISM 5
2. REMOVAL OF CASSETTE TAPE 6
   2-1. Removal of compulsory loading 6
   2-2. Removal of manual operation of Main cam gear 6
3. REMOVAL OF CASSETTE HOLDER UNIT & MECHANISM CHASSIS 7
   3-1. Removal of Cassette holder unit 7
   3-2. Removal of Mechanism chassis 8
4. DISASSEMBLY/ASSEMBLY METHOD FOR MECHANISM 9
   4-1. Disassembly of mechanism 9
   4-2. Assembly and phase adjustment of mechanism 14
   4-3. Assembly of mechanism chassis 20
   Parts Access Flow Chart 23
5. MECHANICAL ADJUSTMENT PROCEDURES 24
   5-1. Tension post position adjustment 24
   5-2. Back tension adjustment 24
   5-3. P2 and P3 posts adjustment 25
   5-4. Tape interchangeability adjustment 25
      5-4-(1). P2 AND P3 POSTS ADJUSTMENT 26
      5-4-(2). ADJUSTMENT OF P4 POST 27
      5-4-(3). HEIGHT ADJUSTMENT OF A/C HEAD 28
      5-4-(4). FINE-ADJUSTMENT OF A/C HEAD 28
      5-4-(5). ADJUSTMENT OF X-VALUE 28
      5-4-(6). FINE-ADJUSTMENT OF X-VALUE 29
   Servicing Fixtures & Tools 30
6. SELF-TEST INDICATION DISPLAY 31
7. SERVICE INFORMATION DISPLAY 33
   7-1. Purpose of Service Information Display 33
   7-2. Turning on Service Information Display 33
   7-3. Use of Service Modes 34
   7-4. Service Information Number 36
   7-5. Test Mode 36
   7-6. Timing chart from Mode SW to System control IC 38
8. SYSTEM CONTROL CIRCUIT & MECHANISM CONTROL CIRCUIT 39
   8-1. STOP 3 Specification 39
   8-2. Stand-by in the STOP3 position 39
   8-3. Supply and Take-up Sensors 40
   8-4. Safety Tab Switch 40
   8-5. Dew Sensor 41
   8-6. Setting time for each mode 42
   8-7. Operation of short CUE 42
   8-8. Loading/Unloading Mechanism lock 42
   8-9. Cassette loading/unloading lock 42
   8-10. Reel lock operation 43
   8-11. Cylinder lock 43
   8-12. Mode transition 44
   8-13. Power on reset 44
   8-14. Linear time counter operation 44
   8-15. Tape speed in CUE/REV mode 44
   8-16. Automatic functions 45
   8-17. CUE/REV lock mode 45
   8-18. FR (Forward/Reverse) search mode 45
   8-19. FF/REW speed 45
   8-20. FF/REW time 45

1. OUTLINE OF Z MECHANISM

1-1. The tape transport path

(1) Mechanism Chassis

Aluminium Chassis has been changed to sheet metal (Thickness: 1.2 mm).

(2) Capstan position (Cassette-in method/Capstan-in method)

The Tape does not touch the Cassette tape so that the rationalization has been promoted such as Reel gear pinch up/down mechanism has been deleted.

(3) Deletion of P1 post

FE Head has been installed Limiter so that P1 post has been deleted.

(4) A/C Head base combined with P4 post

A/C Head has been combined with P4 post on the same base.

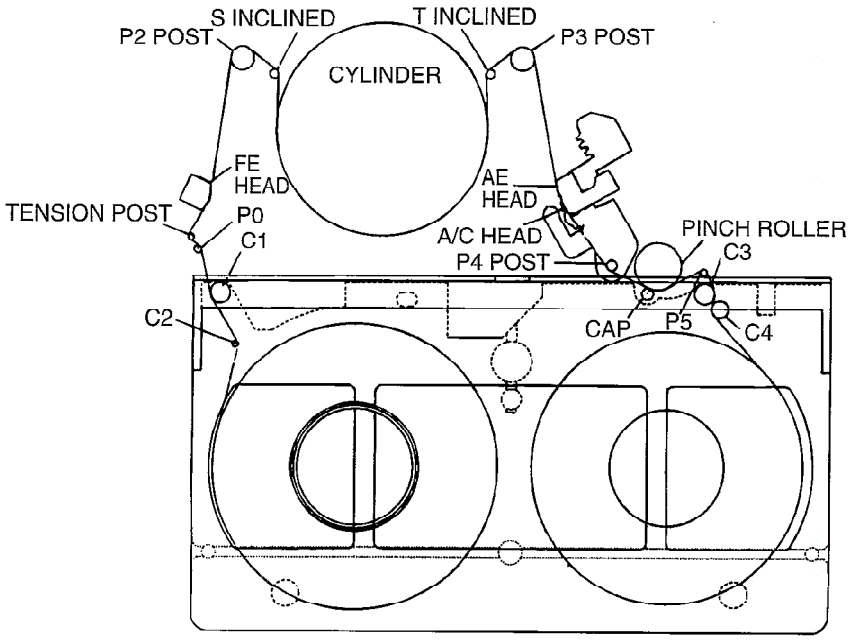
(5) Change of A/C head base type

The change of the angle winding the tape on A/C head has been reduced by the construction of A/C head base has been changed from the revolution type to slide base type.

(6) Improvement of P5 post

P5 post operation has been changed by non-adjustable of the Height and the Tilt adjustment so that the specification has been improved.

Z Mechanism tape transport path in REV mode



1-2. Cassette holder unit

(1) Cassette-in operation

The Rack drive arm drives Main Cam gear by inserting the cassette tape. Consequently, Position switch detects the cassette-in mode so that Loading motor drives. The mode goes to the Stop mode from the Cassette-in through the Loading mode.

① The parts quantity reduction of Cassette holder unit.
(Z Mechanism: 21 pieces, K Mechanism: 36 pieces)
a. Release lever has been installed in Right Side Plate.
b. Cassette guide has been installed in Front Panel unit.
c. Safety lever spring is made by the resin.
d. Opener lever has been changed into the single opener type.
e. One side of Side Plate unit is hung on Chassis in order to fix it.

② Improvement of the cassette insertion
(The force of the cassette insertion Z Mechanism: Approximately 400gm.,
K Mechanism: Approximately 600gm.)
The tooth pitch of Worm gear which has been extended against the previous model, is located on the Motor so that Worm gear can be reversed. Consequently, the Motor rotates before the insertion spring (the combined spring) is working when the cassette tape is inserted, so that the repelled force of the insertion spring has been reduced as differing from the present model.

③ Small-sized Cassette holder unit (Thinned unit)
a. The Wiper arm method which has been adopted, assigned Wiper arm between Cassette Holder Plate and Side Plate so that the small-sized of the width has been realized.
b. To prevent the increment of parts quantity such as Safety lever is used for Pre-open mechanism shown in the present model, and the small-sized unit has been realized by inclining one portion of the L groove in Side Plate.
c. The part of driving change-over is located in the nearest to the center of Reel so that the depth size is compacter.

1-3. Reel brake

(1) Supply Reel Brake is used for Tension Regulator which is composed of the conventional Main brake and the soft brake function.

(2) Take-up Reel Brake is used as Band Brake unit in order to correspond with Supply Reel Brake.

※ Tension Regulator performance:
This is composed of Tension regulator and brake. The tape always is given the tension against the advance direction by Tension band.

(3) Construction of Supply reel tension regulator
Comparison of the construction with the conventional model

	Z Mechanism	K Mechanism
Tension Arm Shaft Bearing construction	Resin	Tension arm
Tension Band	Felt less Lumiller	Felt Lumiller
Braking method	Tension regulator	Main & soft brake

Operating mode and necessary function

Mechanism mode	Necessary function	Operation
Cassette down	Prevention of the tape slag (Soft brake)	Soft brake
Completion of Loading	Prevention of the tape slag (Soft brake)	Tension regulator
REV	Prevention of in Play mode to REV mode (Soft brake)	Tension regulator
PLAY, FF	Back tension adjustment	Same as the conventional
STOP	Main brake function	Tension regulator

(4) Construction of Take-up brake

Take-up brake is used Band brake as well as Supply brake depend on corresponding with Band brake is adopted at the Supply Side.

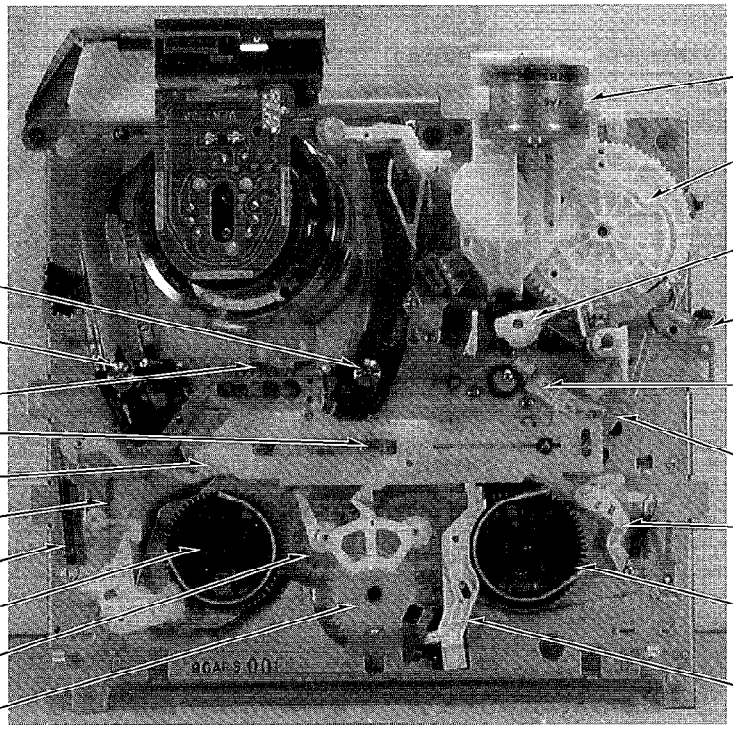
Mechanism mode	Function	Band
EJECT-MID	Soft brake	On
REV	Soft brake	On
PLAY	Release of brake	Off
STOP	Brake	On
FF/REW	Release of brake	Off

1-4. Number of Gear Phase Alignment Point and Replacement Parts

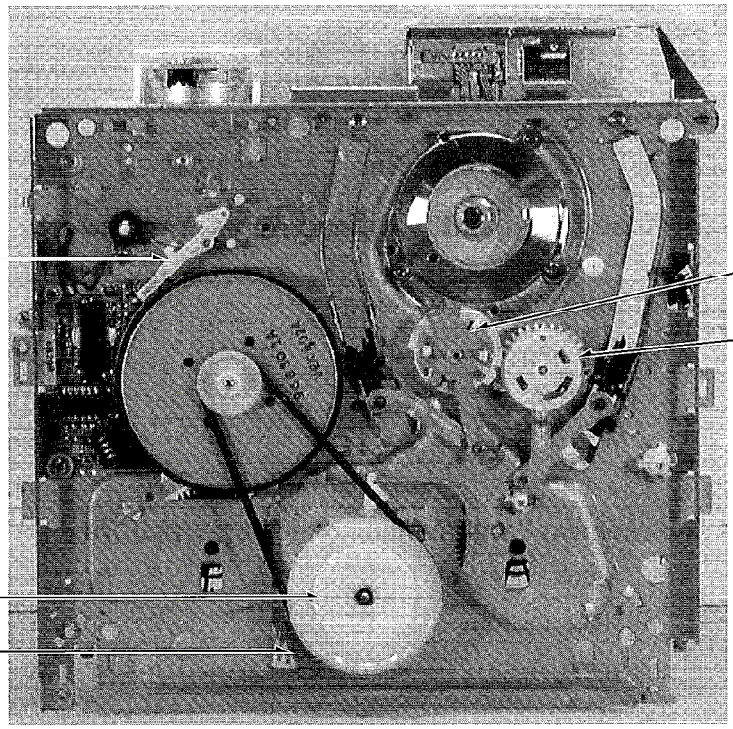
Number of Gear Phase Alignment Point	
G2 Mechanism	12 Alignment Points
G Mechanism	12 Alignment Points
K Mechanism	6 Alignment Points
Z Mechanism	4 Alignment Points
Number of Replacement Parts (including the Screw and Washer)	
G2 Mechanism	Approx.170 Pieces
G Mechanism	Approx. 150 Pieces
K Mechanism	Approx. 100 Pieces
Z Mechanism	Approx. 70 Pieces

Z Mechanism Components

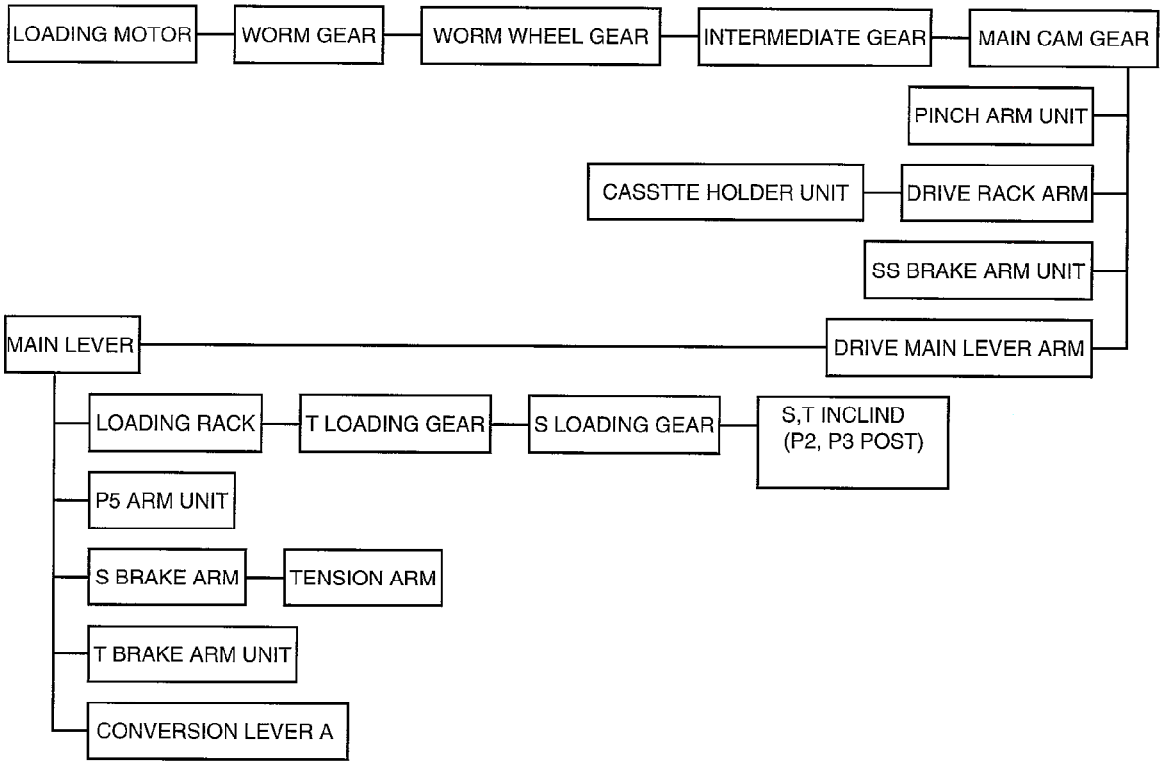
TOP VIEW

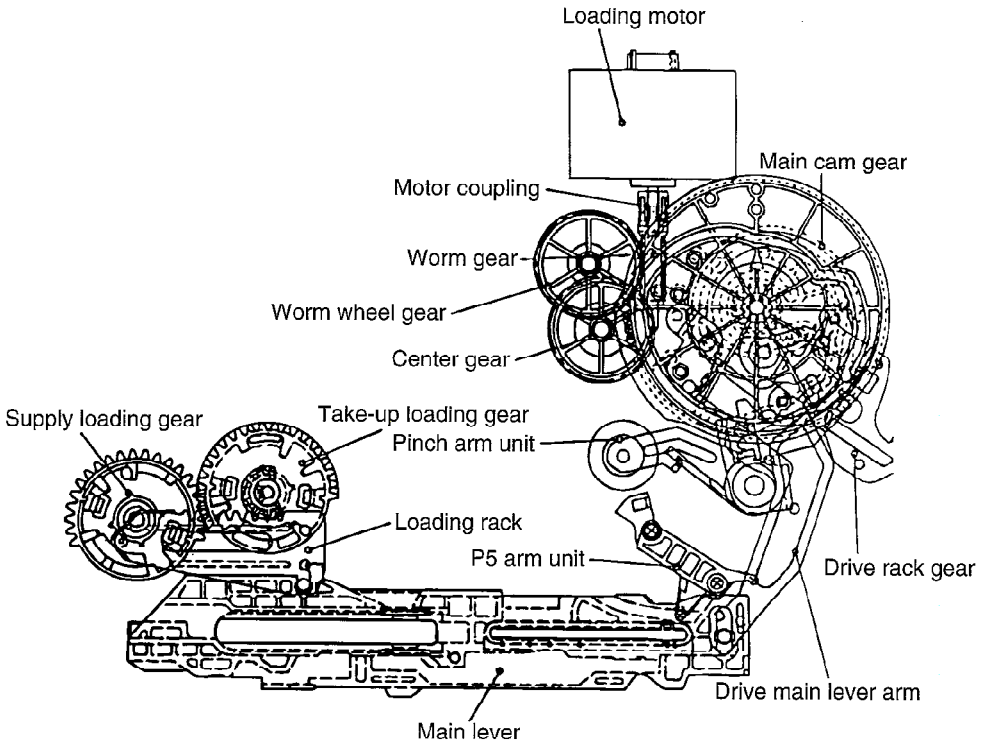


BOTTOM VIEW



FLOW CHART OF LOADING MECHANISM





2. REMOVAL OF CASSETTE TAPE

There are 2 ways to remove a cassette tape.

2-1. Removal of compulsory loading

(1) Press FF, REW and EJECT buttons simultaneously and set the Service Mode 7

(2) Press STOP button in order to unload the mechanism. (Pay an attention of tape slag)
Service Mode Indication :
7 ※※ ※※ (STOP)→7 00 ※※ (EJECT)

2-2 Removal of manual operation of Main cam gear

(1) Disconnect the AC power cord and remove Top Panel.

(2) Rotate Main cam gear to the clockwise and unload the mechanism (Tape is remaining) (Fig. A1).

TOP VIEW

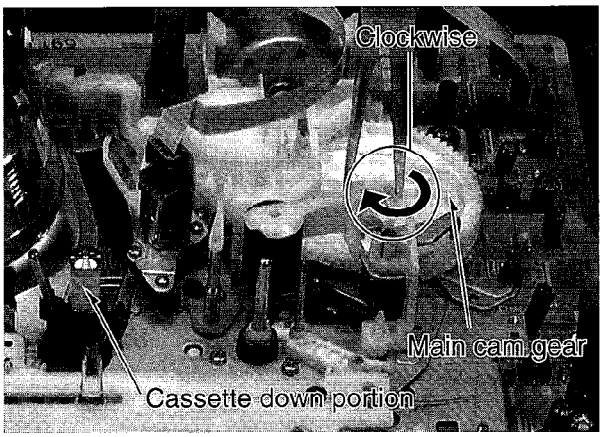


Fig. A1

(3) Rotate the Pole of Capstan motor to the clockwise from the bottom in order to remove the tape slag (Fig. A2).

BOTTOM VIEW

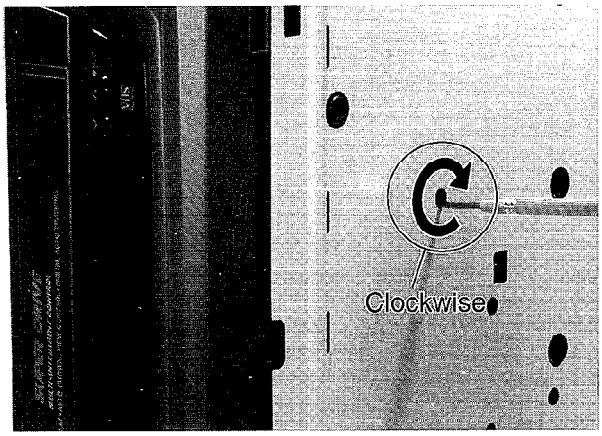


Fig. A2

(4) Rotate Main cam gear to the clockwise in order to eject the cassette tape.

3. REMOVAL OF CASSETTE HOLDER UNIT & MECHANISM CHASSIS

3-1. Removal of Cassette holder unit

(1) Remove Top panel and Front panel unit (Fig. B1)

TOP VIEW

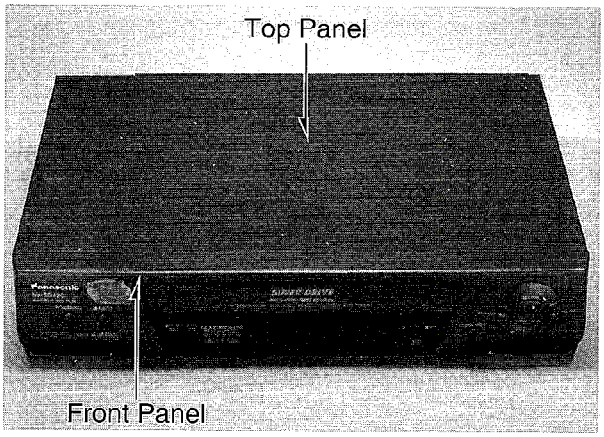


Fig. B1

(2) Remove Top plate

Remove 4 tabs fixing Top plate and remove Top plate (Fig. B2).

※ 4 Tabs should be removed softly duc to they are fragile.

TOP VIEW

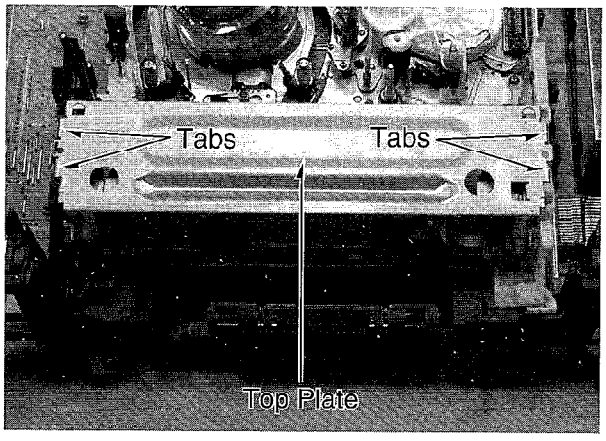


Fig. B2

(3) Remove Casscttc Holder Plate

Keep pressing 2 stoppers on Cassette holder Plate and Press Cassette holder plate to the rear and remove it from Left and Right Side Plate (Fig. B3).

TOP VIEW

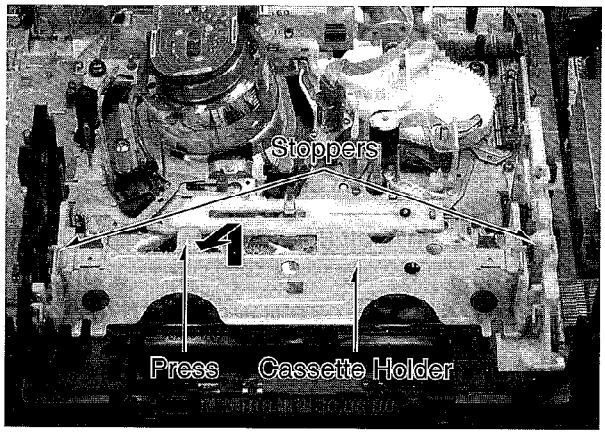


Fig. B3

(4) Remove Left and Right Side Plate

Remove Conjuction spring of Drive gear.

Remove 3 red screws, 3 tabs and remove Left and Right Side Plate (Fig. B4, B5).

TOP VIEW

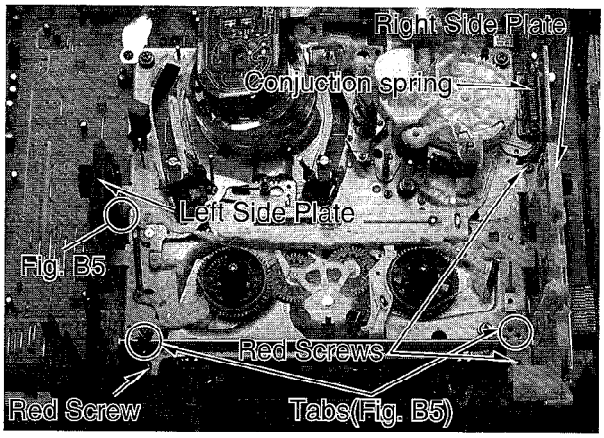


Fig. B4

TOP VIEW

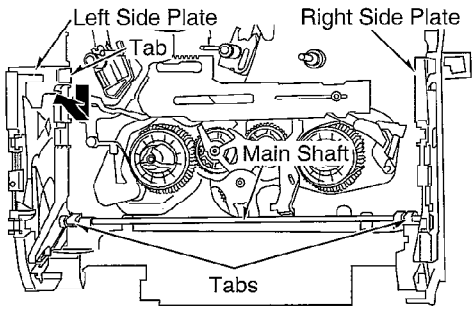


Fig. B5

(5) Remove Main shaft (Fig. B6)

TOP VIEW

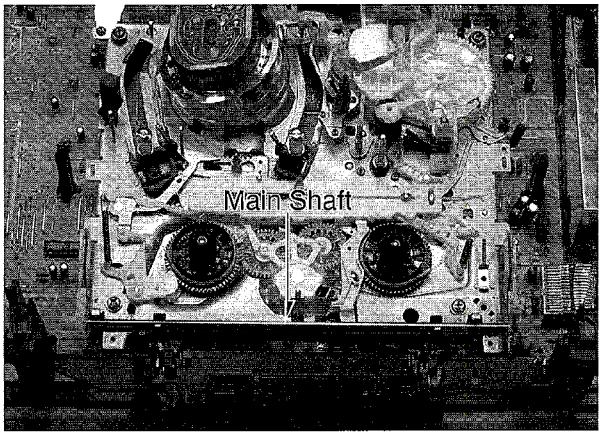


Fig. B6

3-2. Removal of Mechanism chassis

(1) Remove Mechanism chassis

Disconnect P3001, P2502 and P4001. Remove 5 screws (3 red screws and 2 gold screws) on Mechanism chassis and take out Mechanism chassis (Fig. B7).

TOP VIEW

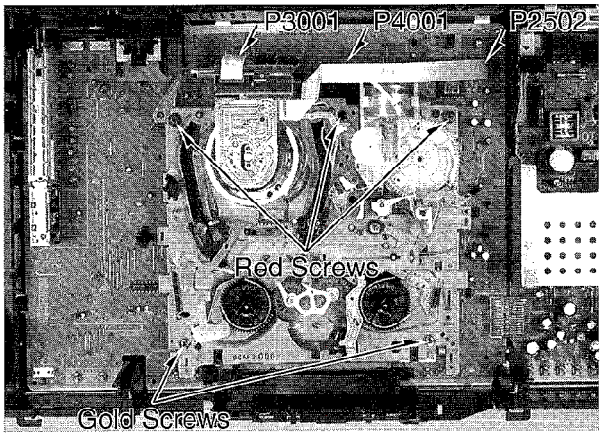


Fig. B7

4. DISASSEMBLY/ASSEMBLY METHOD FOR MECHANISM

4-1. Disassembly of mechanism

1. Removal of Pinch arm

   Unlock the tab (opener space). Remove Opener space and Pinch arm (Fig. C1).

2. Removal of Loading motor unit

   Unlock 3 tabs and remove Loading motor unit (Fig. C1 C2)

   2 tabs of them located on the bottom of the Mechanism (Fig. C2).

TOP VIEW

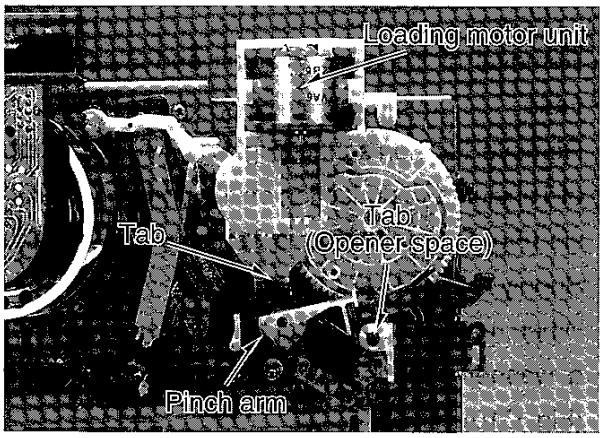


Fig. C1

BOTTOM VIEW

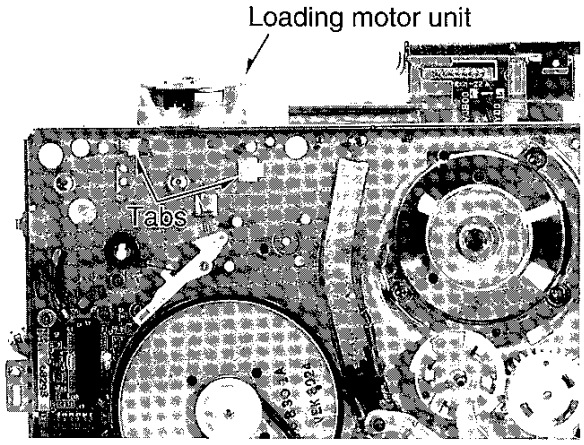


Fig. C2

3. Removal of Main cam gear

   Remove Snap washer located on the bottom of Chassis by using retaining ring remover (Fig. C3) and remove Main cam gear (Fig. C4).

BOTTOM VIEW

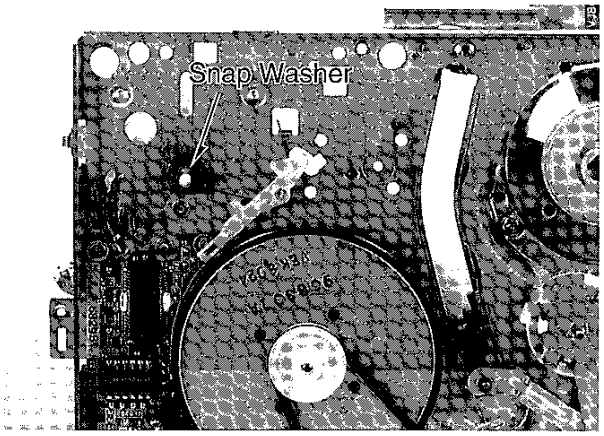


Fig. C3

TOP VIEW

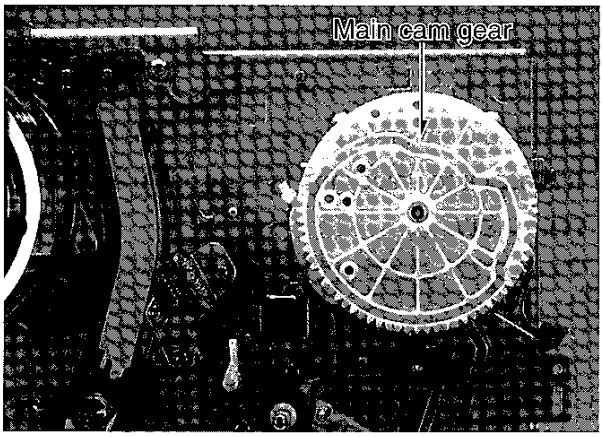


Fig. C4

4. Removal of Drive rack arm

Rotate Drive rack arm to the counterclockwise and remove it (Fig. C5)

TOP VIEW

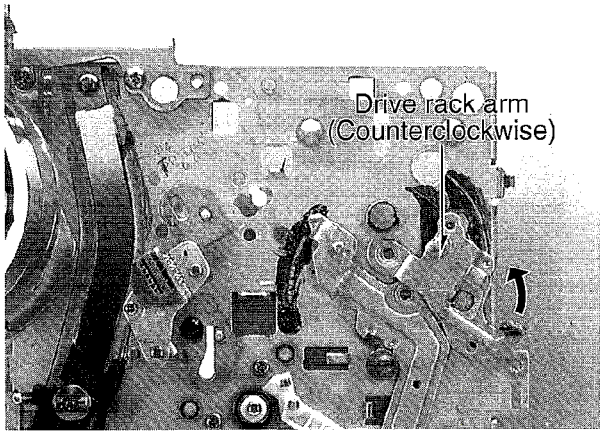


Fig. C5

5. Removal of Main lever, P5 arm and Conversion lever A

Removal cut washer located on the main lever. Unlock 2 tabs of Prism LED and 1 tab on the projection of Chassis while keep lifting the left side of Main lever, and remove Main lever, P5 arm and Conversion lever A (Fig. C6).

※ It is easier to unlock the tabs by using a tweezer.

TOP VIEW

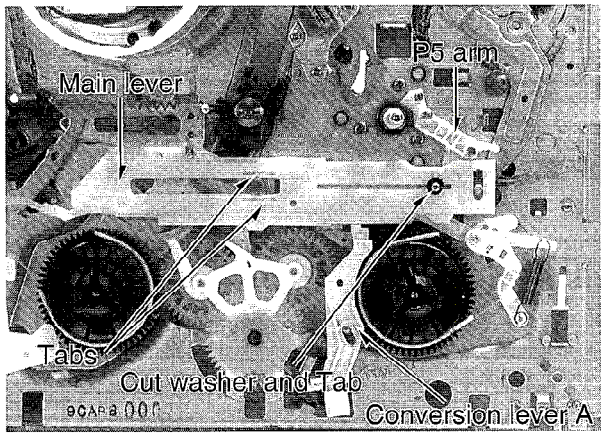


Fig. C6

6. Removal of Drive main lever arm

Rotate Drive main lever arm to the counterclockwise and remove it (Fig. C7).

TOP VIEW

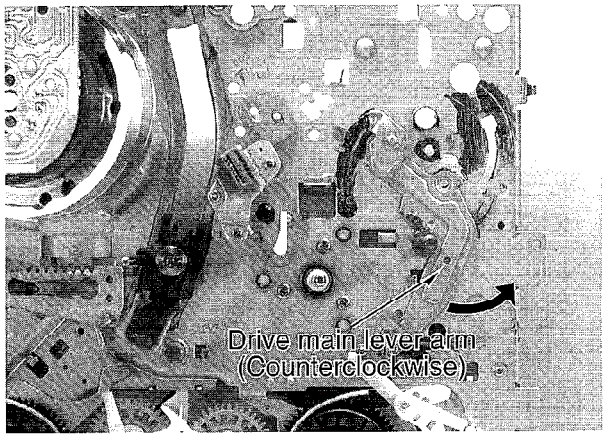


Fig. C7

7 Removal of Tension arm unit and Supply reel table

Remove Tension spring (Fig. C8). Unlock the tab of Tension arm projection on the bottom of Chassis (Fig. C9) and remove Tension arm unit and Supply reel table (Fig. C8).

※ When remove supply reel table, be sure whether a washer attaches on Supply reel table shaft (Fig. C10).

TOP VIEW

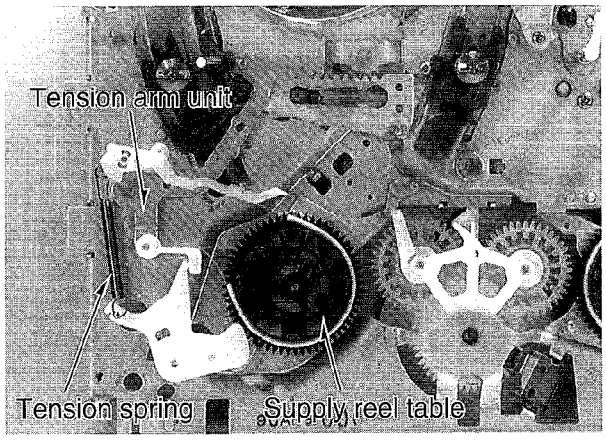


Fig. C8

BOTTOM VIEW

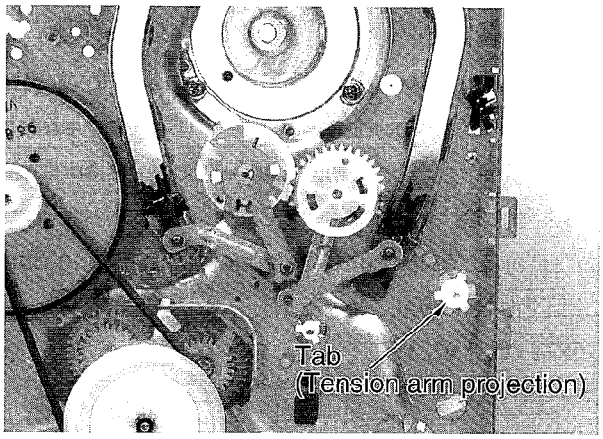


Fig. C9

TOP VIEW

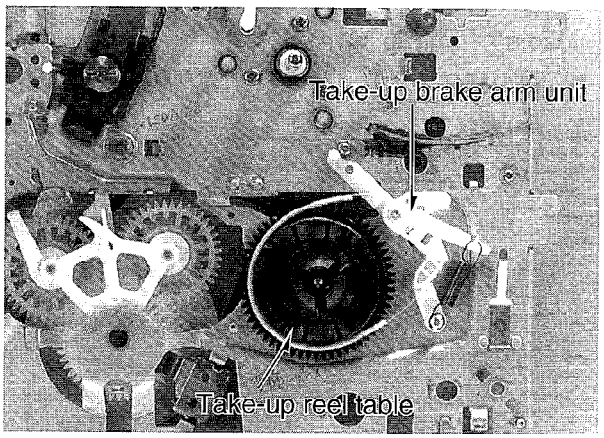


Fig. C11

SIDE VIEW

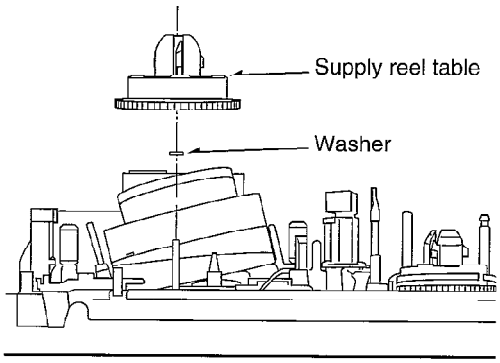


Fig. C10

8 Remove of Take-up brake arm unit and Take-up reel table

Unlock the tab of Take-up brake arm unit from the bottom of Chassis (Fig. C12). Remove Take-up brake arm unit and Take-up reel table (Fig. C11).

※ When remove Take-up reel table, be sure whether a washer attaches on Take-up reel table shaft (Fig. C13).

BOTTOM VIEW

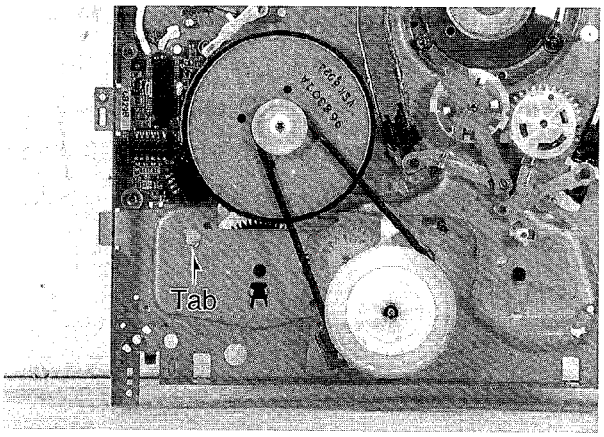


Fig. C12

SIDE VIEW

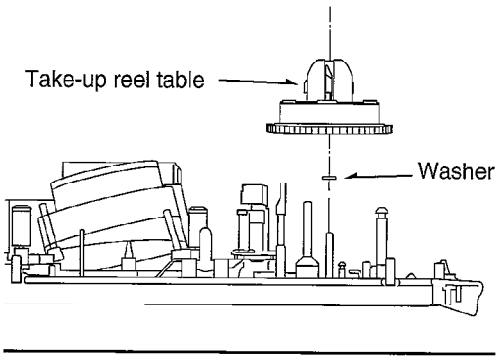


Fig. C13

9. Removal of Take-up & Supply loading arm
Unlock the tab and remove Take-up and Supply loading arm (Fig. C14).

BOTTOM VIEW

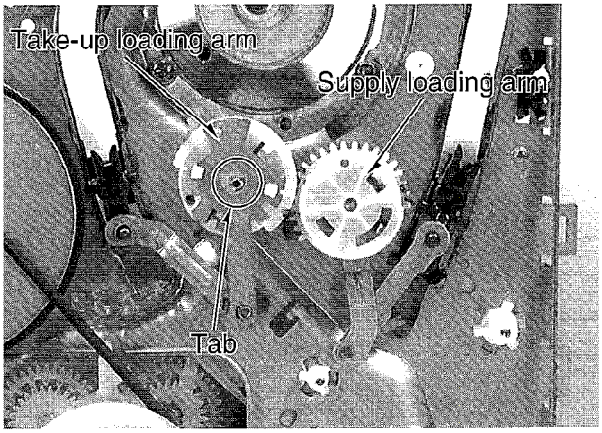


Fig. C14

10 Removal of Prism LED, Take-up & Supply shaft holder and Loading rack
Push the tab of Prism LED and remove Prism LED Remove Take-up and Supply shaft holder from the groove of Chassis and remove Loading rack (Fig. C15).

TOP VIEW

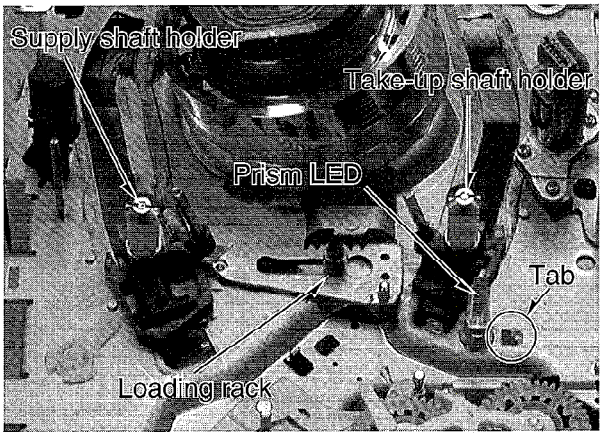


Fig. C15

11. Removal of Center clutch, Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit
Remove the Belt and the Cut washer (Fig. C16).
Remove Center clutch (Fig. C16) Conversion gear spring, Conversion gear, Conversion lever B and Idler arm unit (Fig. C17).

※ Pay an attention of Conversion gear spring during the removal.

BOTTOM VIEW

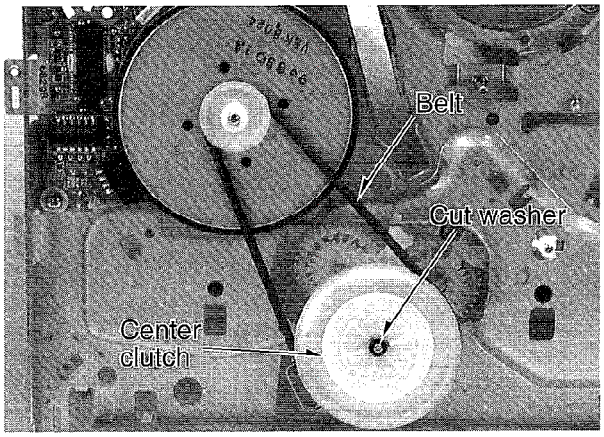


Fig. C16

BOTTOM VIEW

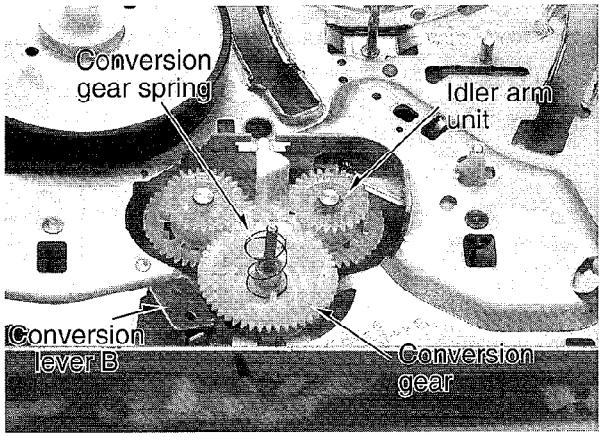


Fig. C17

12. Removal of Capstan unit

Remove 3 gold screws (Fig. C18).

Remove 2 gold screws on the bottom of Chassis (Fig. C19)

Keep moving SS brake arm and remove Capstan unit.

TOP VIEW

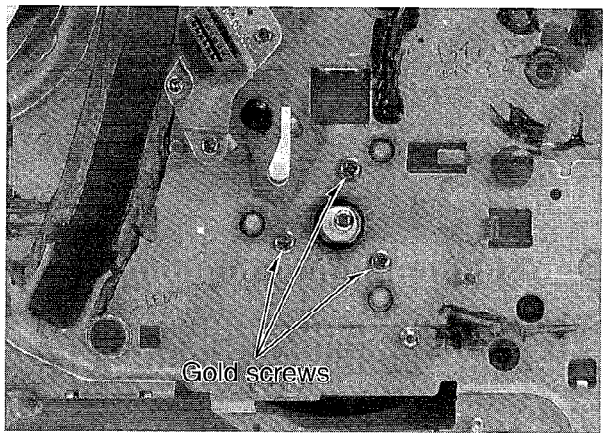


Fig. C18

BOTTOM VIEW

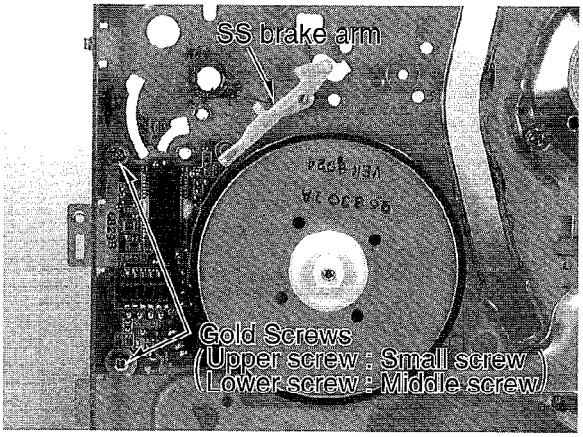


Fig. C19

13. Removal of Cylinder unit

Removal red screw (Fig. C20).

Remove 3 gold screws on the bottom of Chassis and remove Cylinder unit (Fig. C21).

TOP VIEW

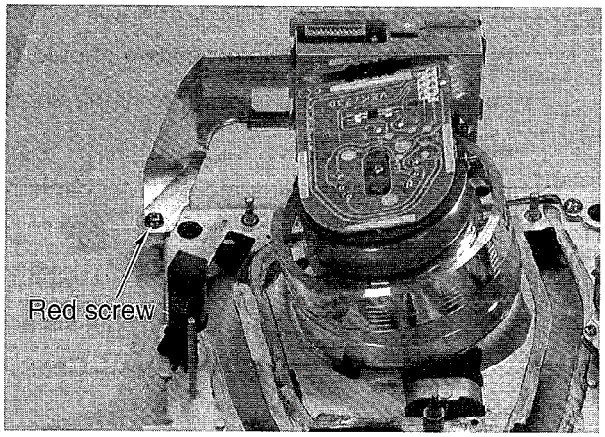


Fig. C20

BOTTOM VIEW

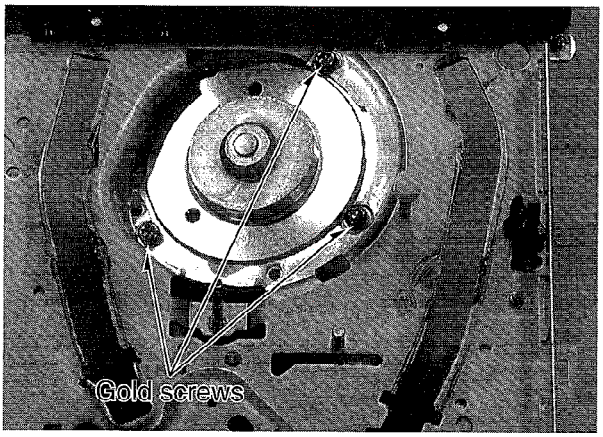


Fig. C21

4-2. Assembly and phase adjustment of mechanism

The gear phase alignment has been performed in the EJECT position and it is crucial for the Z Mechanism to operate correctly.

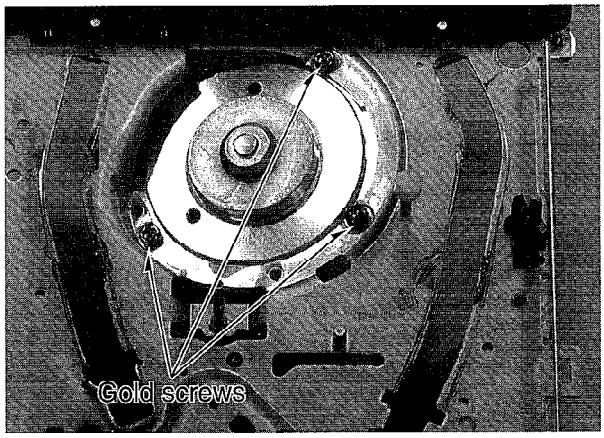
NOTE: In case of the parts replacement like Position switch, Mechanism position should be set to Eject position in order to fit the phase of Position switch

1 Assembly and phase adjustment of Mechanism

(1) Assembly of Cylinder unit

Cylinder unit should be fixed by 3 screws (GOLD) from the bottom side of Mechanism chassis and red screw on the top side of Mechanism Chassis (Fig. E1, E2).

BOTTOM VIEW



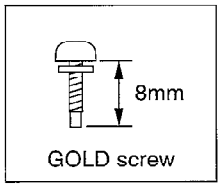
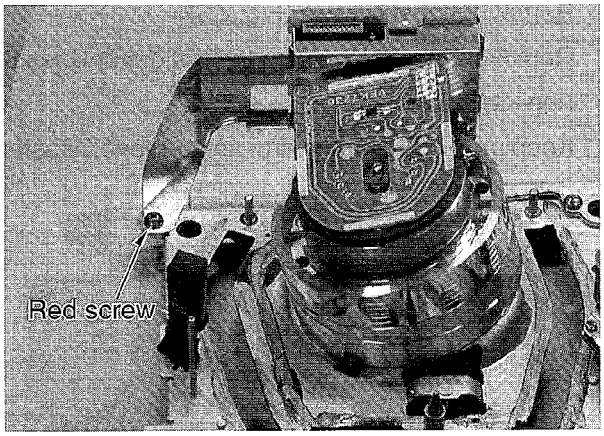


Fig. E1

TOP VIEW



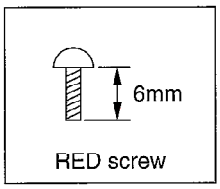
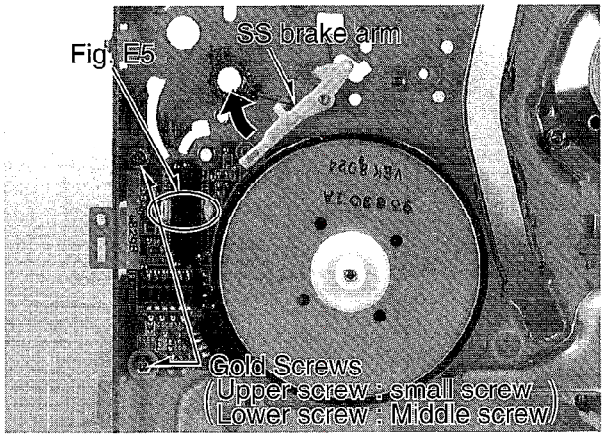


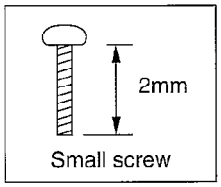
Fig. E2

(2) Assembly of Capstan unit

Move SS brake arm in the direction of arrow (see Fig. E3) and capstan unit should be fixed by 2 screws (GOLD) on the bottom side of Mechanism chassis and 3 screws (GOLD) on the top of Mechanism chassis (Fig. E3 E4)

BOTTOM VIEW





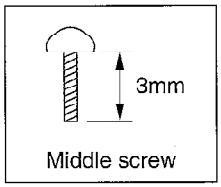
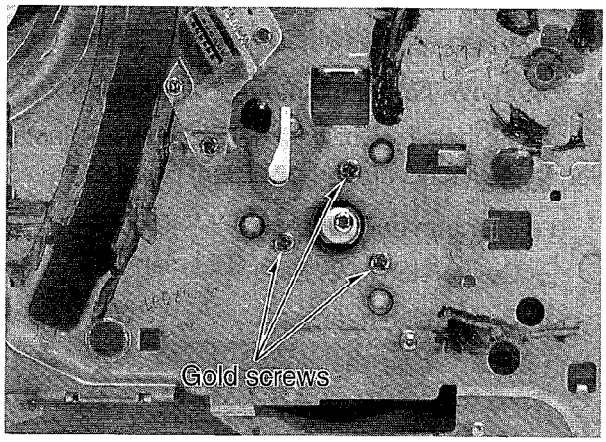


Fig. E3

TOP VIEW



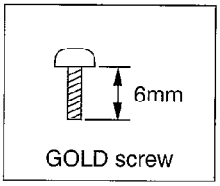


Fig. E4

NOTE: Replacement of Capstan unit and Procedure of applying the silicone grease.

REPLACEMENT OF CAPSTAN UNIT

In case of replacement of the Capstan Unit the Silicone grease have to be applied between the Mechanism chassis and the Drive IC by the following procedure.

Silicone grease No. VFK1301 for radiation of the Drive IC

Silicone grease is used for the radiation of the Drive IC. The heat occurred on the IC is radiated to the Mechanism chassis through the grease. In case of the incomplete radiation, the safety circuit operates depending on the rise of the temperature and it possibility stop the operation of the Drive IC

PROCEDURE OF APPLYING THE SILICONE GREASE

① There is a cut-out part at the Drive IC mounting position and the bottom of the IC can be seen from the cut-out part Apply the Silicon grease to whole the cut-out part of IC as shown in Fig. E5-1 so that the grease is piled 0 3–0 5 mm from the surface of the C B A

② Next, from the component side of the C.B A., apply the Silicon grease so that the grease is piled at the metal of the center of the IC as shown in Fig. E5-2.

Fig. E5-1. Apply the Silicon grease so that the grease is piled 0.3 0.5 mm from the surface of the C.B.A.

Fig. E5-2. Apply the Silicon grease at the metal of the center of the IC.

SIDE VIEW

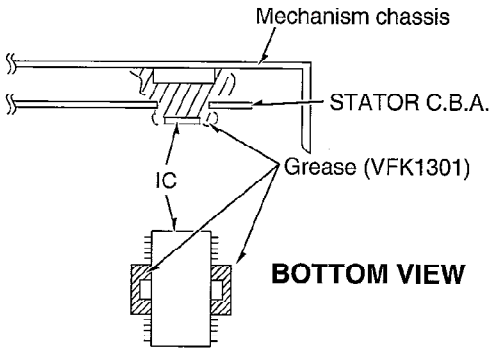


Fig. E5

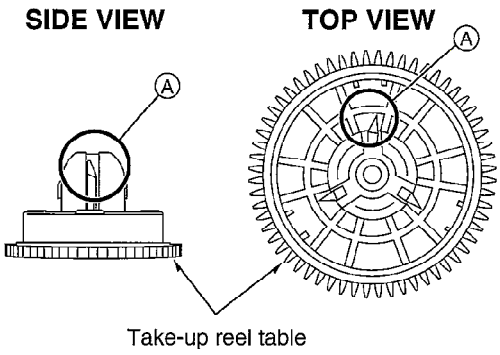


Fig. E11

(7) Assembly of Supply reel table and Tension arm unit

Install washer (Fig. E13) and Supply reel table. Insert Tension arm unit to Tension arm projection and hang Tension spring with Supply spring arm projection (Fig. E12).

※1 Pay an attention of Position of the Supply spring arm.

NOTE: The shape between portion A for Take-up reel table and portion B for Supply reel table is different.

Therefore, confirm the shape of portion A and B before mounting reel tables. If Take-up reel table has been confused with Supply reel table and they have been installed, the trouble of reel table rotation slip happens (Fig. E14).

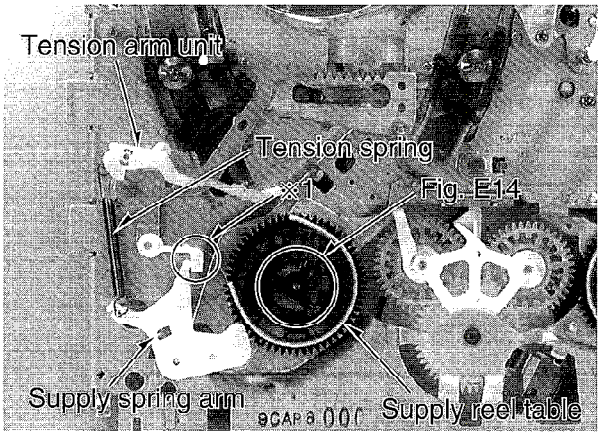


Fig. E12

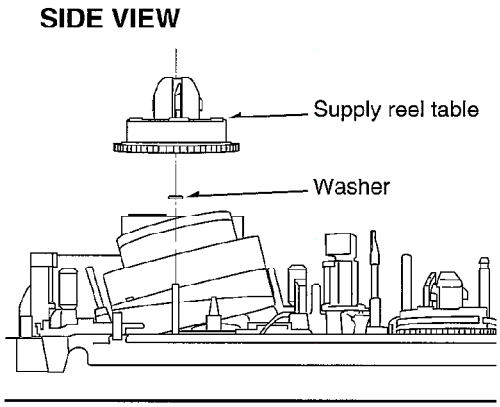


Fig. E13

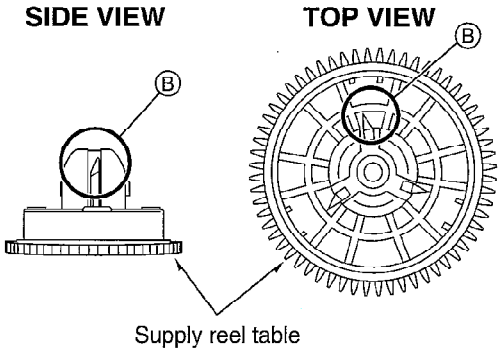


Fig. E14

(8) Assembly of Drive main lever arm

Install Drive main lever arm so that Drive main lever arm fits to the groove of Chassis.

And rotate Drive main lever arm to the clockwise in order to adjust the phase between the hole of the position fixture and the penetration hole of Chassis (Fig. E15).

TOP VIEW

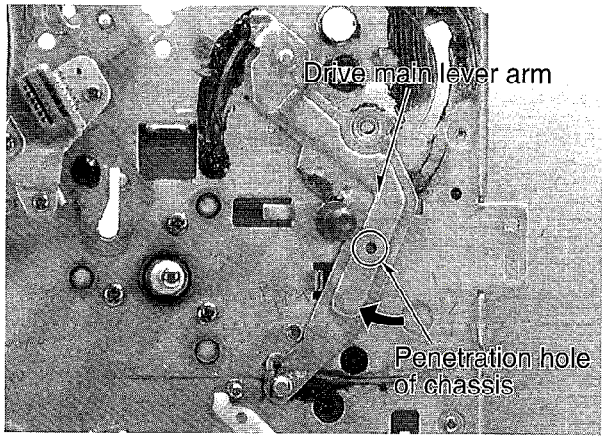


Fig. E15

(9) Assembly of Conversion lever A, P5 arm and Main lever

Install Conversion lever A and P5 arm (Fig. E16, E17).

Adjust the phase of Main lever so that Main lever fits the projection of Loading rack.

Main lever has to be locked at the projection of Chassis by 2 tabs of Prism LED (Fig. E16).

※ Conversion lever A, P5 arm, Supply brake arm unit and the projection of Take-up brake arm have to be installed to the groove under the Main lever (Fig. E18).

TOP VIEW

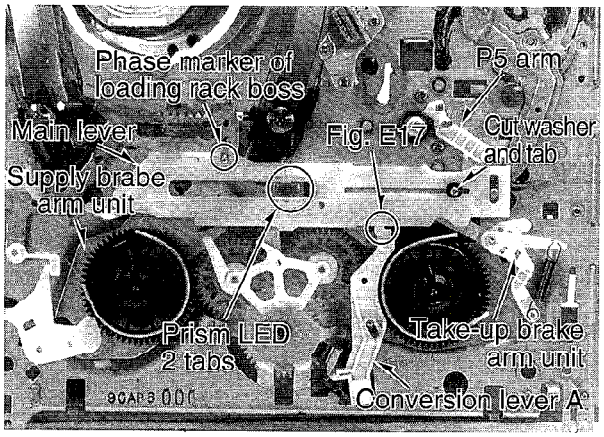


Fig. E16

TOP VIEW

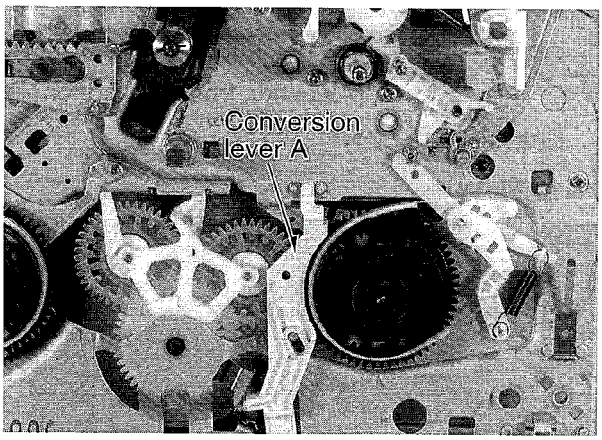


Fig. E17

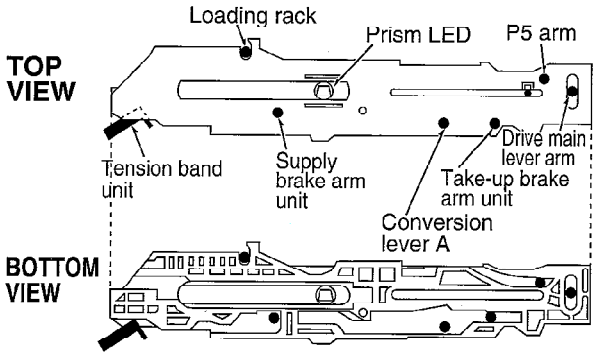


Fig. E18

(10) Assembly of Drive rack arm

Install Drive rack arm so that Drive rack arm fits the groove of Chassis and rotate it to the clockwise in order to fit the penetration hole of Chassis (Fig. E19)

TOP VIEW

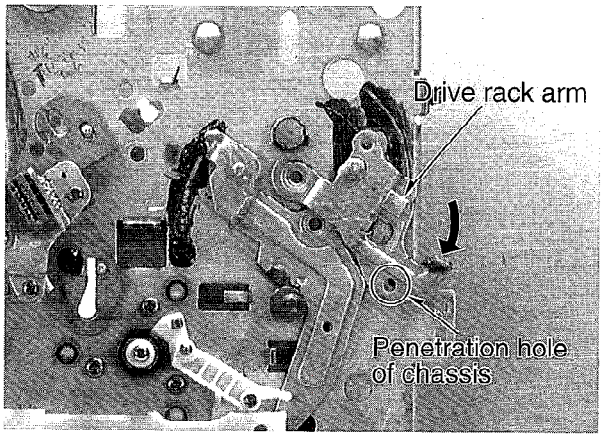


Fig. E19

(11) Assembly of Main cam gear

Install Main cam gear so that Main cam gear fits the penetration hole of Chassis (Fig. E20) and fix it by the snap washer from the bottom of Chassis (Fig. E21).

TOP VIEW

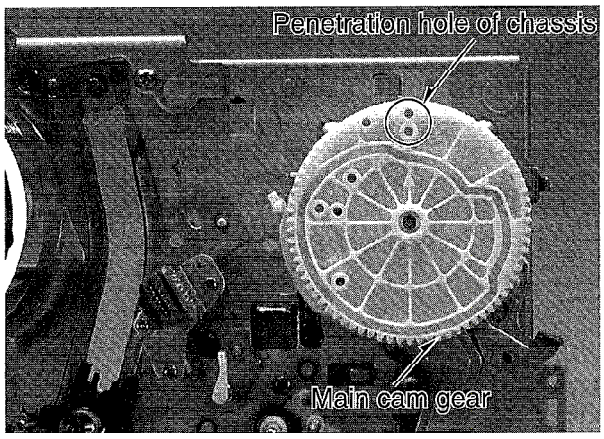
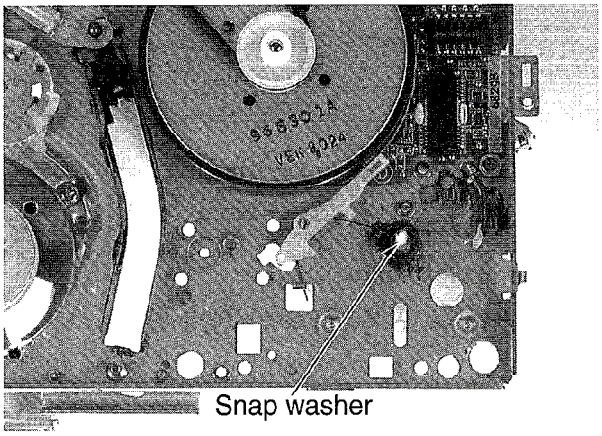


Fig. E20

BOTTOM VIEW



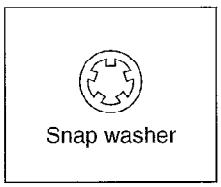


Fig. E21

(12) Assembly of Loading motor unit

Install Loading motor unit so that Loading motor unit fits the groove of Chassis (Fig. E22).

(13) Assembly of Pinch arm

Put Pinch arm together and install Opener space to fix Pinch arm (Fig. E22).

TOP VIEW

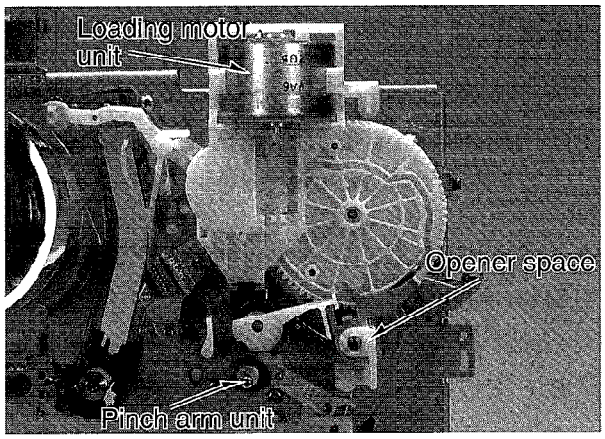


Fig. E22

4-3 Assembly of mechanism chassis

1 Assembly of Mechanism chassis

(1) Adjust the phase of Position switch in Main C B A..

Rotate Position switch until the click point. The projection of Position switch should be set to just above (Fig. F1)

TOP VIEW

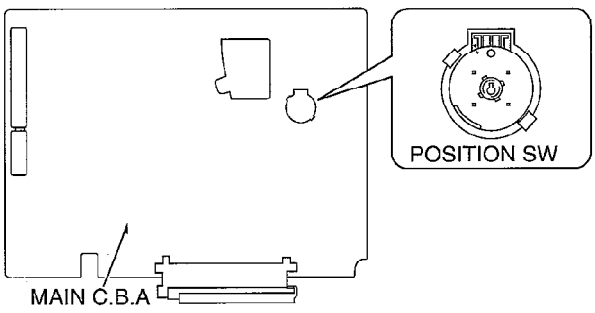


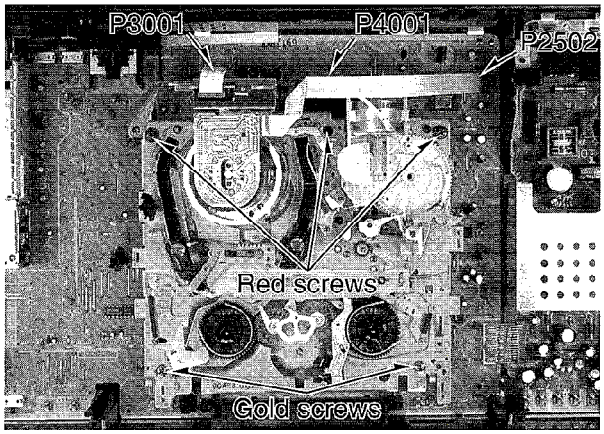
Fig. F1

(2) Assembly of Mechanism chassis

Put Mechanism chassis on Main C.B.A. and fix it by 5 screws (3 red screws and 2 gold screws).

Connect P3001, P2502 and P4001 (Fig. F2)

TOP VIEW



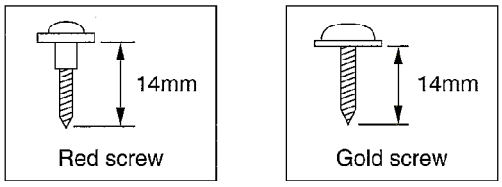


Fig. F2

※ The red screws has a gap among the chassis. Therefore be careful not to tighten too much.

2. Assembly of Cassette holder unit

(1) Assembly of Main shaft

Install Main shaft so that Main shaft fits the groove of Chassis (Fig. F3)

TOP VIEW

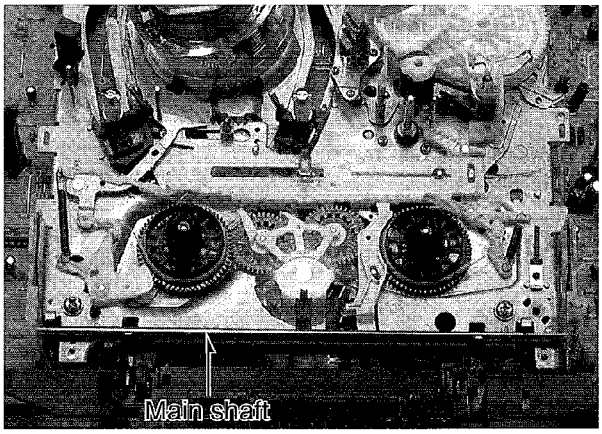


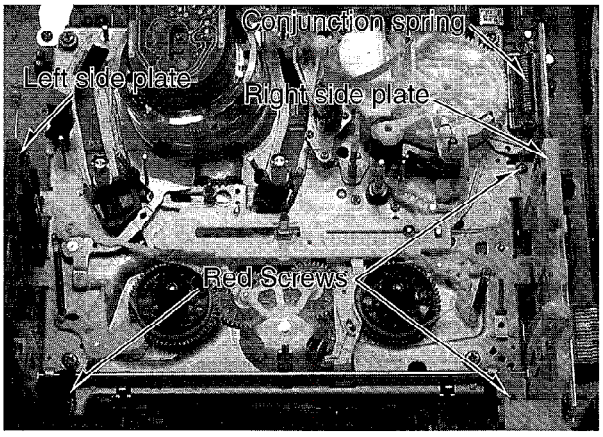
Fig. F3

(2) Assembly of Left & Right side plate

Install Left side plate so that Left side plate fits the groove of Chassis and fix it by the red screws.

After adjustment the phase of waper arm and Drive rack (Fig. F5), install Right side plate so that Right side plate fits the groove of Chassis and fix it by 2 red screws. Hang Conjunction spring on the projection of Drive rack arm (Fig. F4, F5).

TOP VIEW



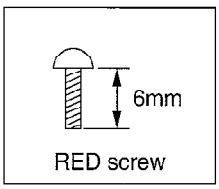


Fig. F4

SIDE VIEW

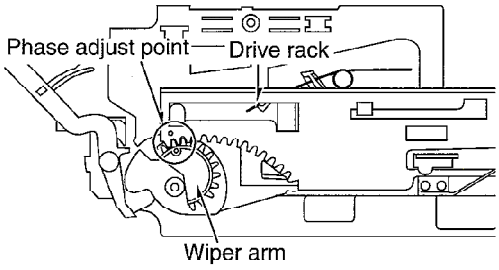


Fig. F5

TOP VIEW

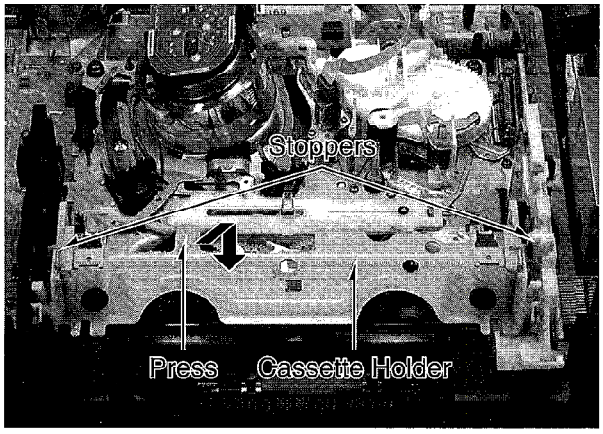


Fig. F6

(3) Assembly of Cassette holder

Install Cassette holder so that Cassette holder fits the groove of Waper arm installed in Main shaft (Fig. F6, F7).

TOP VIEW

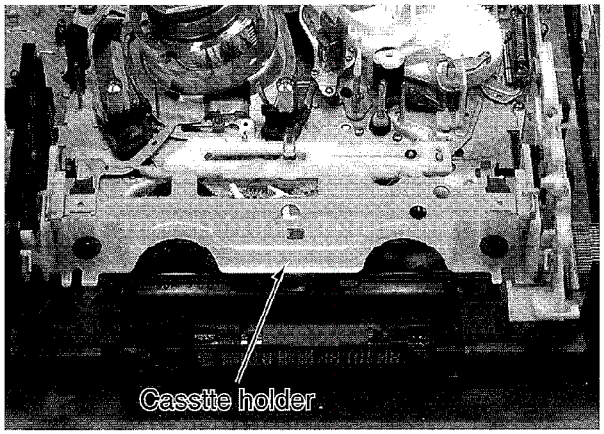


Fig. F7

(4) Assembly of Top plate

Install Top plate so that Top plate fits the groove of Left and Right side plate.

※ Fix Top plate by tightening screw when the tabs of Left and Right side plate broke (Fig. F8)

TOP VIEW

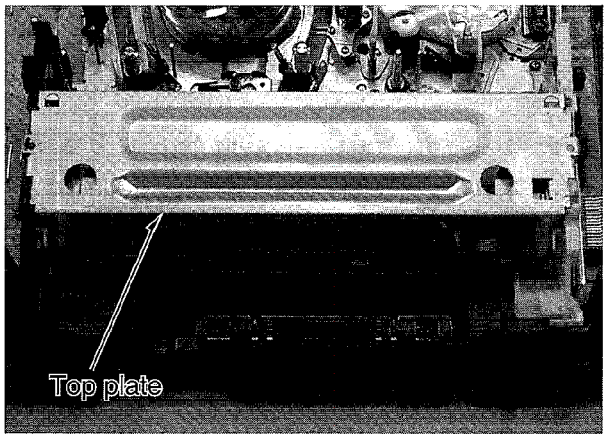
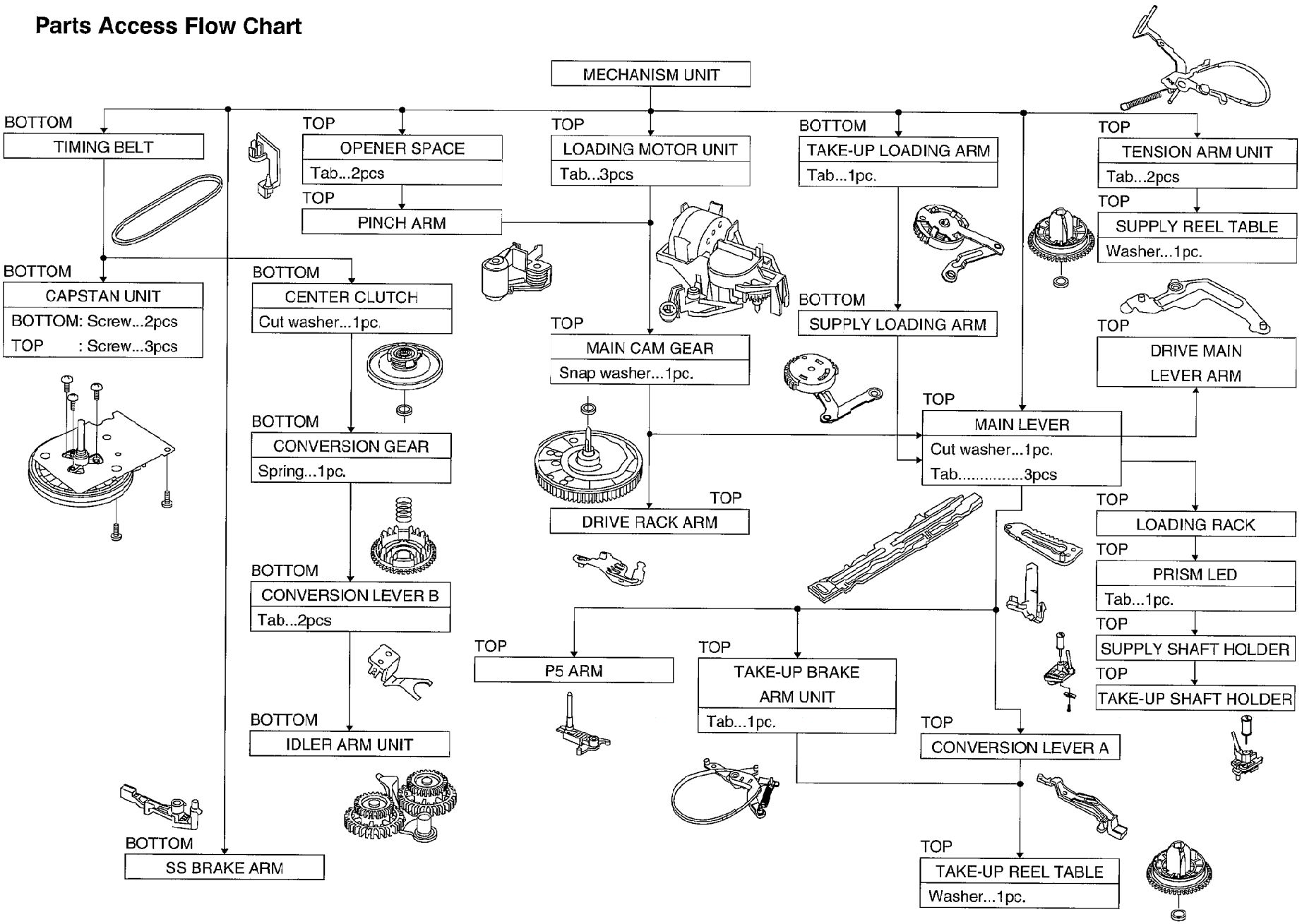


Fig. F8

(5) Install Front panel unit and Top panel

Parts Access Flow Chart



5. MECHANICAL ADJUSTMENT PROCEDURE

5-1. Tension post position adjustment

Equipment required: Hex. Wrench (VFK0326)
Specification: 50.5±1.5 mm

(1) Disconnect the AC plug.

(2) Remove the TOP PLATE.

(3) Turn the LOADING MOTOR until the loading completes.

(4) Adjust the hole of Tension Band Fastener by Hex Wrench until the distance between the Tension Post and the center of Supply reel table is 50.5±1.5 mm as shown in Fig. M1.

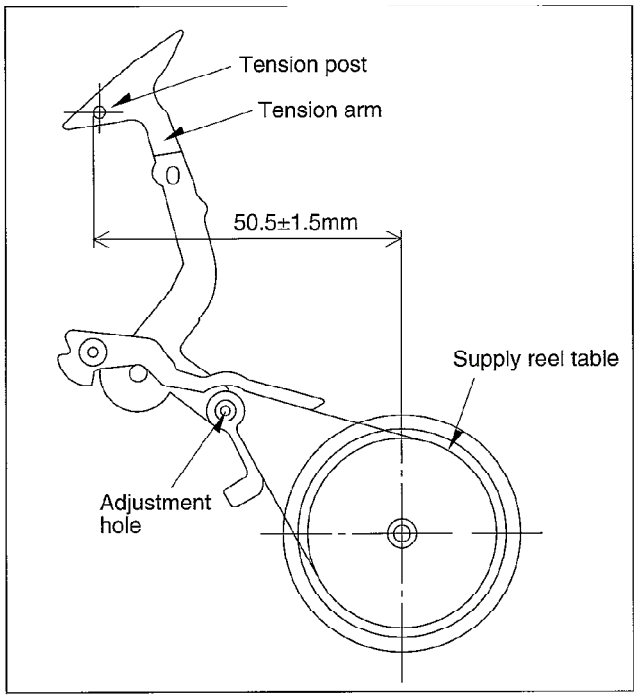


Fig. M1

5-2. Back tension adjustment

Equipment required:
Back Tension Meter (VFK0132)
VHS Cassette tape (180 minutes tape: PAL)
VHS Cassette tape (120 minutes tape: NTSC)
Specification: 22.5–27.5g

(1) Playback the cassette tape from the beginning and wait until the tape movement get the stabilization. (for approx. 10–20 seconds)

(2) Insert the Back Tension Meter into the path of a tape, and measure the back tension to be within specification as shown in Fig. M2.

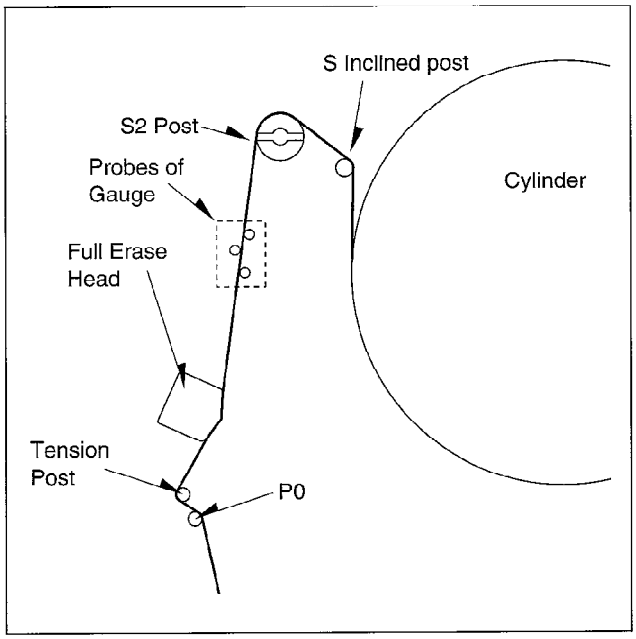


Fig. M2

(3) If it is out of specification, change the spring notch as shown in Fig. M3.

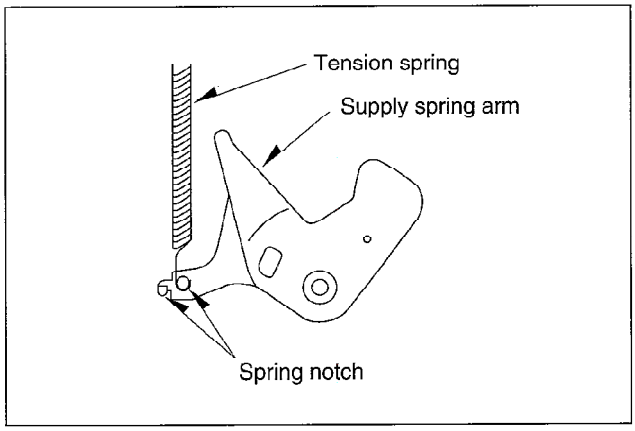


Fig. M3

5-3. P2 and P3 posts adjustment (PREADJUSTMENT)

Equipment Required:
Post Adjustment Screwdriver (VFK0329)

(1) Remove the Top Plate.

(2) Turn the Loading Motor until the unloading completes.

(3) Rotate the P2 and P3 Posts clockwise to the end. (Fig. M4)

(4) Rotate the P2 and P3 Posts twice counterclockwise. (Fig. M4)

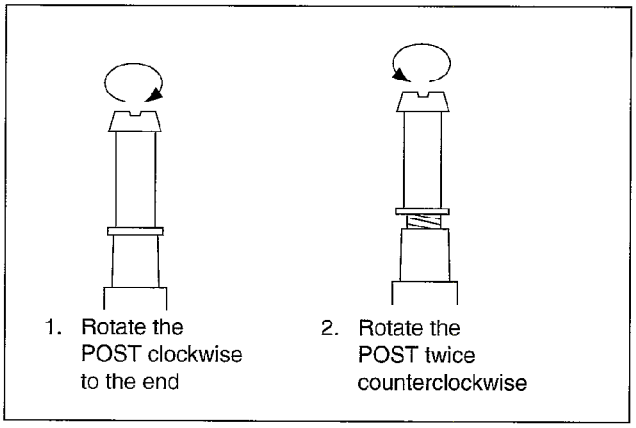


Fig. M4

(5) Playback the cassette tape and make sure that the edges of the tape are not curling at the bottom or top end of the P2, P3, and P4 Posts as shown in Fig. M5.

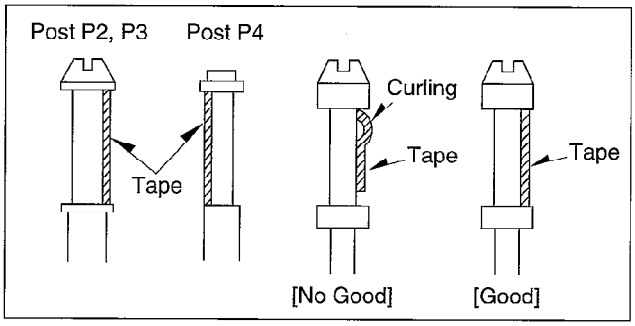


Fig. M5

(6) If the curling appears, readjusts the P2 and P3 Posts.

5-4. Tape interchangeability adjustment

Carry out the following procedures for Tape Interchangeability Adjustment to do it correctly and smoothly.

(1) P2 AND P3 POSTS ADJUSTMENT
(2) ADJUSTMENT OF P4 POST
(3) HEIGHT ADJUSTMENT OF A/C HEAD
(4) FINE-ADJUSTMENT OF A/C HEAD
(5) ADJUSTMENT OF X-VALUE (PREADJUSTMENT)
(6) FINE-ADJUSTMENT OF X-VALUE

If the Tape Interchangeability Adjustment is not perfect, repeat the above procedures from (1) to (6).

CAUTIONS: To make an Adjustment Mode for Tape Interchangeability, press the FF, REW and EJECT buttons simultaneously 3 times to set the Service Mode 2.

NOTE: Cleaning the Tape Transport path before adjusting of Tape Interchangeability. The detail portion is shown below.

P0 Post, Tension Posts, FE Head, P2 Post, Supply Inclined Post, Cylinder Unit, Take-up Inclined Post, P3 Post, A/C Head, P4 Post, Pinch Roller, Capstan Shaft, P5 Post. FE Head, Cylinder Unit, A/C Head and Capstan Shaft are more important parts and pay an attention to clean them.

5-4-(1). P2 AND P3 POSTS ADJUSTMENT

Equipment required:
Alignment Tape (PAL/SECAM: VFJ8125H3F)
(NTSC: VFM8080HQFP)
Post Adjustment Screwdriver (VFK0329)

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

NOTE: To get a stable waveform of the Head Amp output (observation point TW3001 and TW2001 located on Main C.B.A.) on the oscilloscope, use the head switching pulse as a triggering signal as shown in Fig. M6.

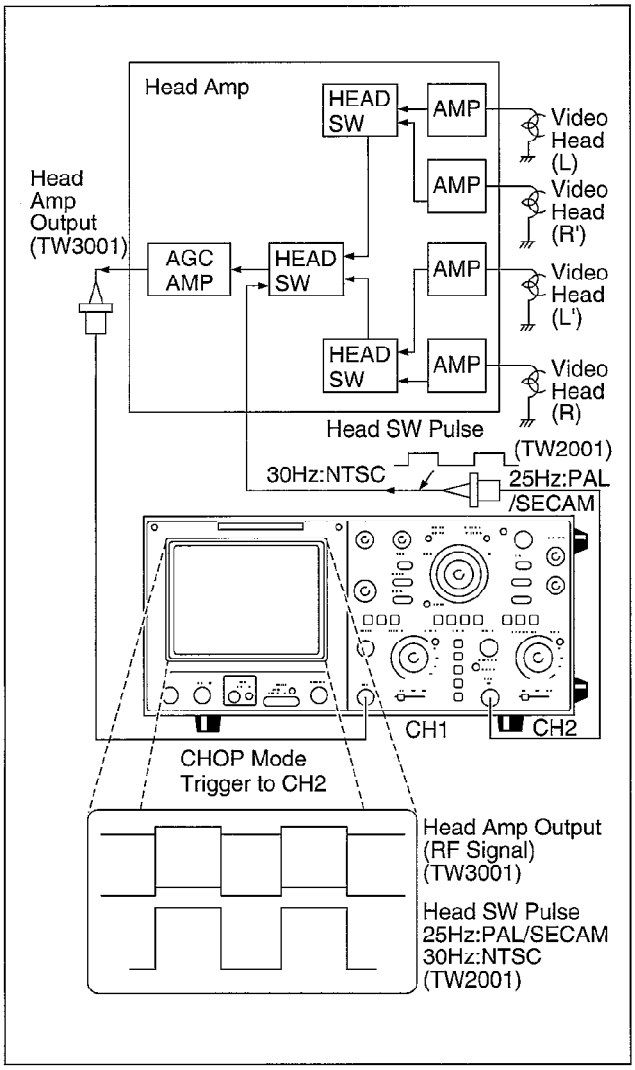


Fig. M6 Connect of Oscilloscope

(2) Playback the Alignment Tape.

(3) If the RF envelope appears like example "A" or "B" in Fig. M7, then adjustment of the tape guide post (P2: Entrance) is necessary.

(4) Adjust the tape guide post (P2) with the post adjustment screwdriver so that the RF envelope waveform at the entrance portion becomes flat as shown in Fig. M7 "C".

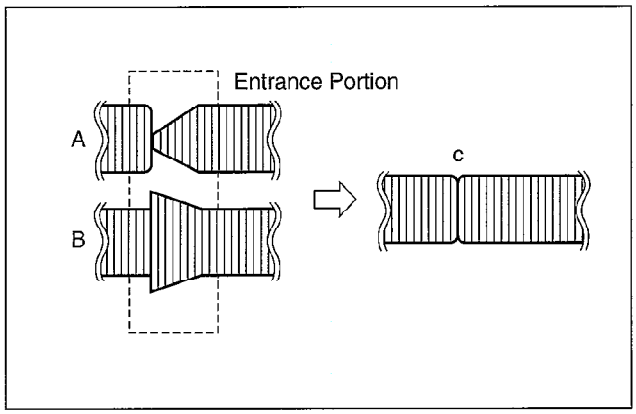


Fig. M7

(5) If the RF envelope appears like "D" or "E" in Fig. M8, then adjustment of the tape guide post (P3: Exit) is necessary.

(6) Adjust the tape guide post (P3) in the same manner as the P2 post so that the exit portion becomes flat as shown in Fig. M8 "F".

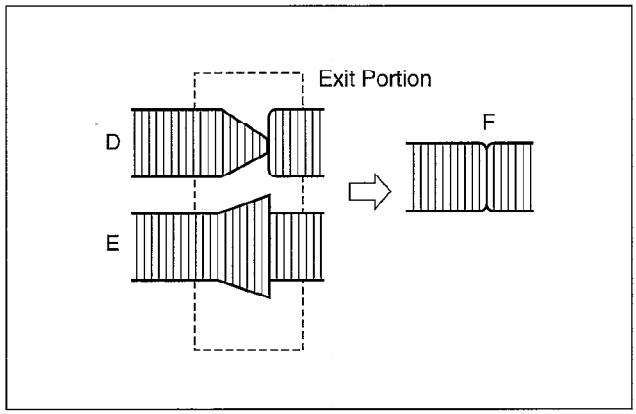


Fig. M8

(7) Keep pressing the tracking up/down (∧ or ∨) buttons on the remote controller unit. The output envelope should vary nearly parallel with other condition as shown in Fig. M9.

(8) Set the tracking control into center fix position by pressing the tracking up/down (∧ and ∨) simultaneously and adjust for maximum RF envelope, whilst being as flat as possible.

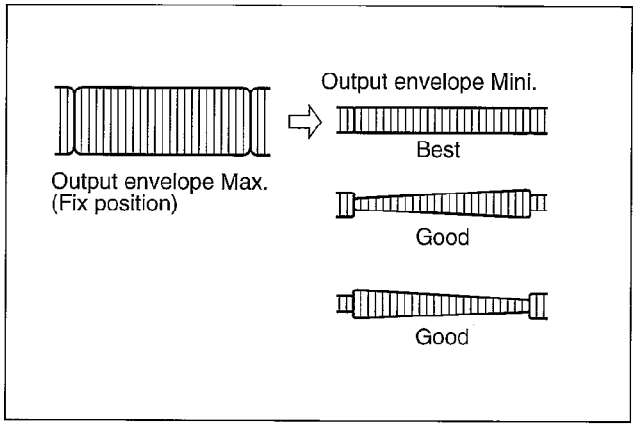


Fig. M9

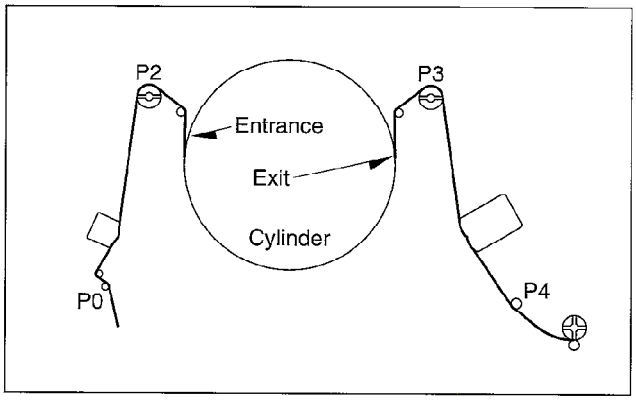


Fig. M10 Loading of Posts

5-4-(2). ADJUSTMENT OF P4 POST

(1) Install A/C Head on the Mechanism Chassis by one screw.

(2) Playback the Alignment Tape.

(3) Rotate the screw (A) or (B) until the wrinkle appears on the lower edge of tape at P4 Post.

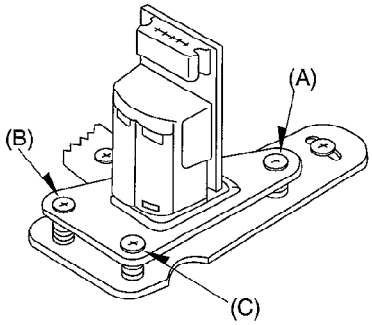
(4) Rotate the screw (A) or (B) until the wrinkle just disappears on the lower edge of tape at P4 Post.

(5) Connect the oscilloscope to audio output terminal.

(6) Rotate the screw (C) until audio signal is maximized.

NOTE: 1. The relation between the rotation direction of screws (A) and (B) and the condition of wrinkle on the lower edge at P4 Post as shown in Fig. M11.

2. Make sure that there is not the inclined wrinkle between P4 Post and Pinch Roller.



	SCREW (A)	SCREW (B)
So wrinkle appears on the lower edge of tape	COUNTER CLOCKWISE	CLOCKWISE
So wrinkle disappears on the lower edge of tape	CLOCKWISE	COUNTER CLOCKWISE

Fig. M11

5-4-(3). HEIGHT ADJUSTMENT OF A/C HEAD

<When moving the A/C Head up>

(1) Rotate the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (B) counterclockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) counterclockwise until the audio signal is maximized.

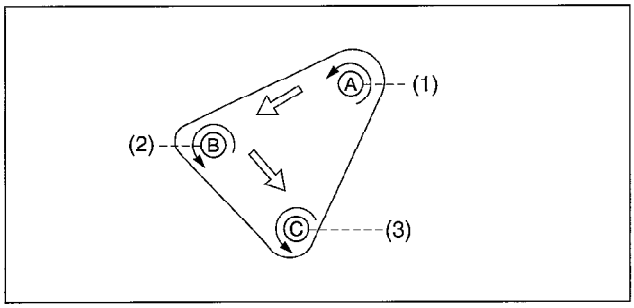


Fig. M12

<When moving the A/C Head down>

(1) Rotate the screw (B) clockwise until the wrinkle appears on the lower edge of tape at P4 Post.

(2) Rotate the screw (A) clockwise until the wrinkle just disappears on the lower edge of tape at P4 post.

(3) Rotate the screw (C) clockwise until the audio signal is maximized.

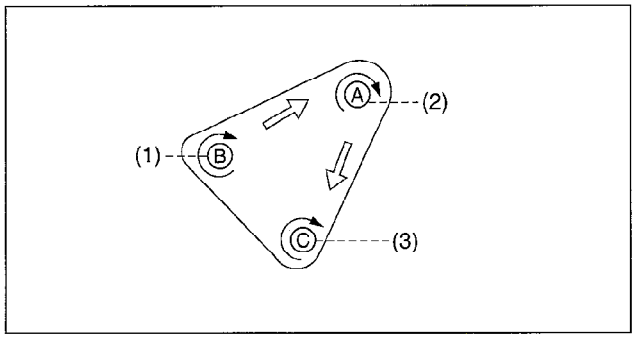


Fig. M13

5-4-(4). FINE-ADJUSTMENT OF A/C HEAD

(1) Connect the oscilloscope to the output of the Head Amp as shown in Fig. M6.

(2) Playback the Alignment Tape.

(3) Make sure that the condition of the wrinkle at P4 Post. If the condition of the wrinkle is out of specification, P4 Post adjustment has to be performed as follows.

Turn the screw (A) counterclockwise until the wrinkle appears on the lower edge of tape at P4 Post.

Turn the screw (A) clockwise until the wrinkle disappears on the lower edge of tape at P4 Post.

(4) Turn the screw (C) until the audio signal is maximized.

NOTE: Make sure that the audio output does not increase when push the upper and lower edges of tape around A/C Head.

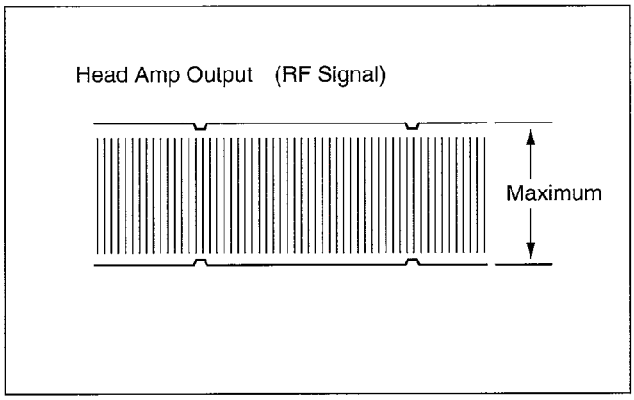


Fig. M14

5-4-(5). ADJUSTMENT OF X-VALUE (PREADJUSTMENT)

Equipment required:
Fine Adjustment Gear Drive (VFK0330)
Specification: Less than 15 msec.

(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the Alignment Tape and set the tracking control into center fix position.

(3) Adjust A/C Head position by the Fine Adjustment Gear Driver (VFK0330) to meet the signal fault portion of the audio output and the video output signals (Less than 15 msec.).

(4) After meeting the signal fault portion, adjust A/C Head position by the Finc Adjustment Gear Driver (VFK0330) until the video envelope is maximized.

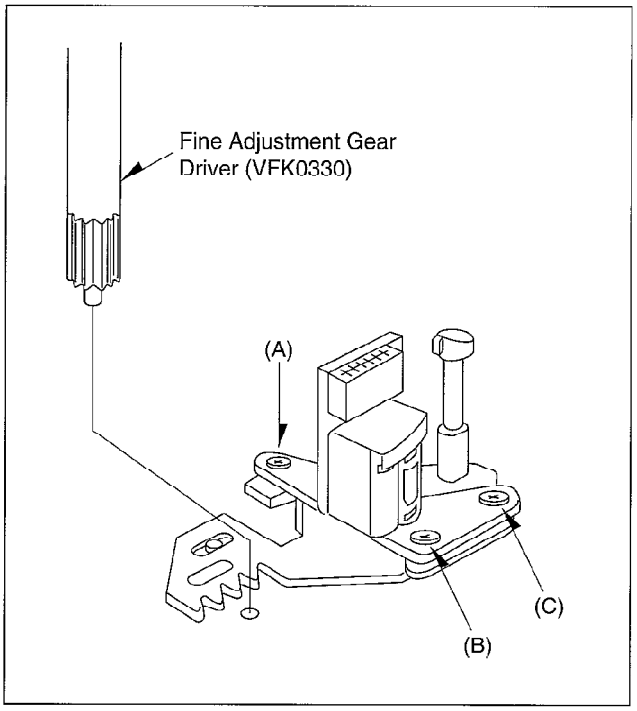


Fig. M15

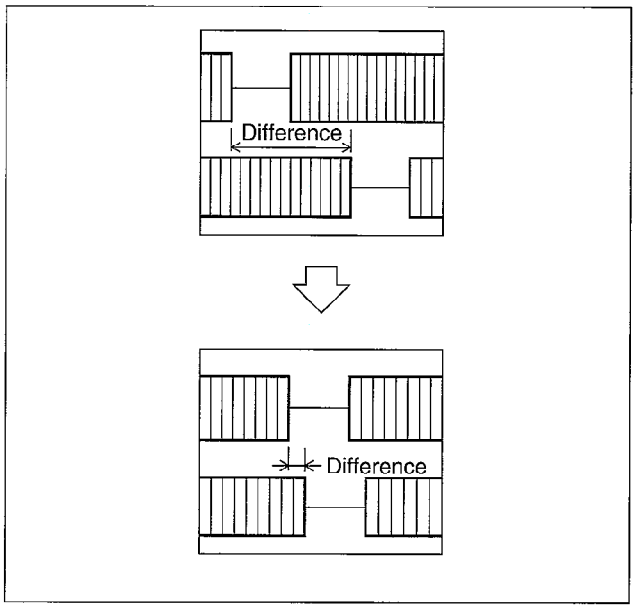


Fig. M16

5-4-(6). FINE-ADJUSTMENT OF X-VALUE

Equipment required:
Fine Adjustment Gear Drive (VFK0330)

(1) Connect the oscilloscope to the audio output and the video output. Both output signals should be fixed by the external trigger.

(2) Playback the alignment tape and set the tracking control into center fix position.

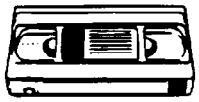
(3) Adjust A/C Head position by the Fine adjustment Gear Driver (VFK0330) until the video envelope level is maximized at the tracking center fix position.

NOTE: During X-Value Fine Adjustment, in case the video envelope level became 0, Preadjustment of X-value should be adjusted again due to it is possibility to vary the X-value adjustment.

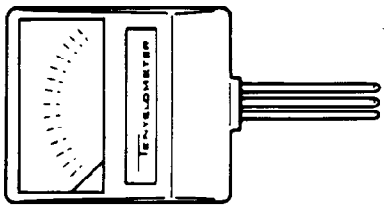
Servicing Fixtures & Tools

VFJ8125H3F
PAL VHS Alignment Tape

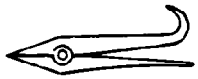
VFM8080HQFP
NTSC VHS Alignment Tape



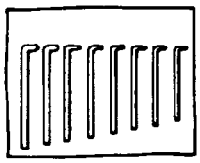
VFK0132
Back Tension Meter
(Tentelometer, Made in U.S.A.)



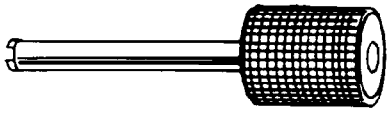
VFK0335
Retaining Ring Remover
(3mm/4mm)



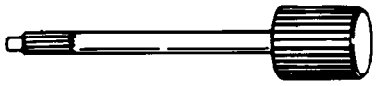
VFK0326
Hex. Wrench Set
(0.7, 0.9, 1.2, 1.5, 1.6, 2.0, 2.4, 3.0mm)



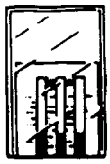
VFK0329
Post Adjustment Screwdriver



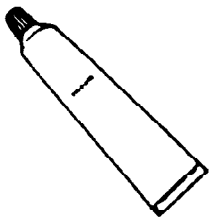
VFK0330
Fine Adjustment Gear Driver



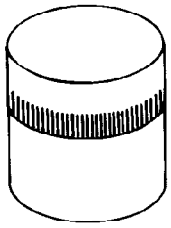
VFK27
Hand Cleaning Stick



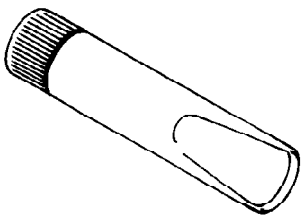
VFK1024
Morlytone Grease



VFK1298
Floil Grease



VFK1301
Silicone Grease



6. SELF-TEST INDICATION DISPLAY

This VTR has a self-diagnosis and display function. If the VTR detects trouble during installation or during use, one of the following fault indication codes will automatically appear in the VTR display. Fault indication codes are displayed in the form of a single English letter followed by two numbrs, as for example "H01".

Note: 1. The indication "U" is displayed on the FIP while power remains on.

2. Otherwise, the indication "H" or "F" is displayed on the FIP, and the power is automatically turned off

   When the power is turned on again, the fault indication code will disappear and the unit will retrun to normal display mode (either clock or counter is displayed).

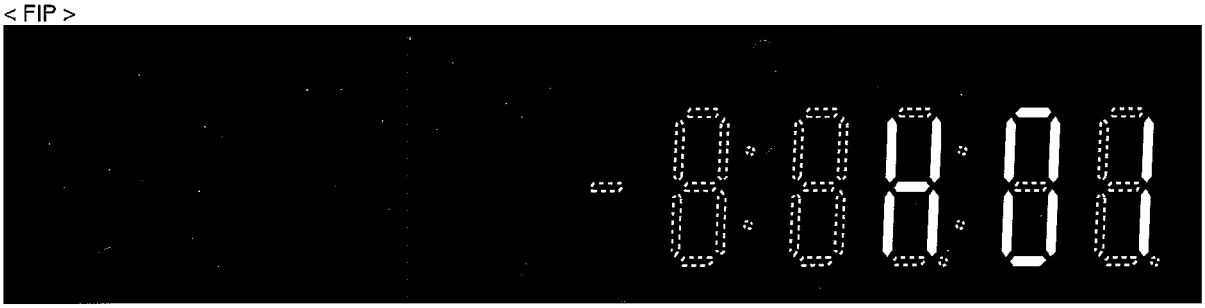
3. This fault indication code will be stored in the Timer microprocessor even with the AC plug disconnected.

   The two-digit number portion of the stored fault indication code can be redisplayed in the FIP's "second" display portion (the last 2 digits on the light) by placing the unit is Service Mode Number 2 when turning on Service Information Display as for example "01" or "02" etc.

   If a second error occurs, only the most recent error will be displayed and stored.

4. To erase the stored fault indication code data, Press FF, REW and EJECT buttons for 5 seconds.

< FIP >



INDICATION	CAUSE	REMEDY/CHECK
U 10	Dew formation.	Wait until the indication disappears.
U 11	Cylinder clogs during the play mode.	Cleaning the cylinder.
H 01	After cylinder lock is detected, the cylinder does not start rotating again even after tape unloading.	Check the cylinder motor drive circuit.
H 02	Cassette tape is not wound up during tape unloading except Eject mode.	Check the capstan motor drive circuit.
F 03	Mechanism locks during mode transition except Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment. 3. Check the mode switch.
F 04	Mechanism locks during tape unloading.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment.
F 05	Cassette tape is not wound up during tape unloading in Eject mode.	1. Check the capstan motor drive circuit. 2. Check the Supply/Take-up reel pulse.
F 06	Mechanism locks after tape unloading in Eject mode.	1. Check the loading motor drive circuit. 2. Check the mechanism phase alignment for cassette holder unit.
F 07	During recording mode recording signal is less than the normal condition.	Protection of the overcurrent flowing in transistor which produce the power supply for recording mode.
F 09	No communication of the main serial (between the system control and FIP driver control).	Check the system control microprocessor.

Fig. T1 Self-Test indication Display

7. SERVICE INFORMATION DISPLAY

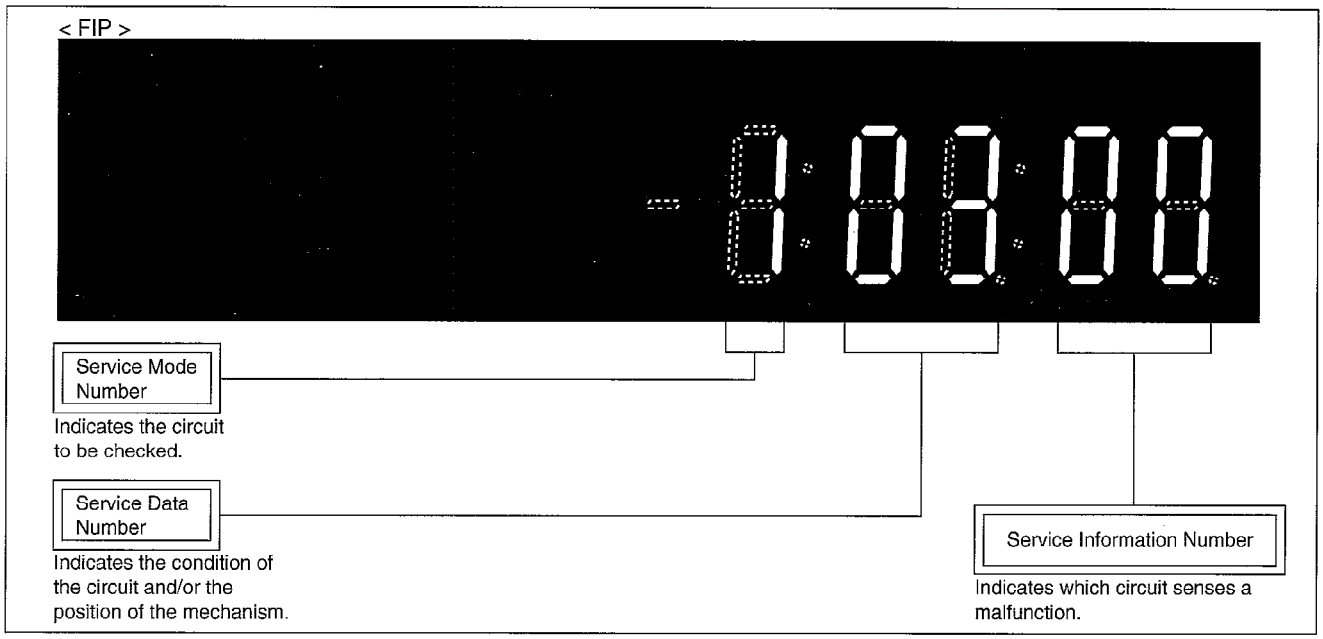

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.
Service Information Number
Indicates which circuit senses a malfunction.

Fig. D1 Service Information Display

7-1 Purpose of Service Information Display

This information aids trouble shooting by indicating the source of the malfunction. The service mode number & service data number are used by the technician during repair while the service information can be used by consumer to diagnose malfunctions allowing the technician to provide a more accurate repair cost estimate and reduce repair time.

7-2. Turning on Service Information Display

Press FF, REW and EJECT buttons simultaneously.

In the Service Information Display, there are four digits divided into 3 functions.

The first digit indicates which of the 7 service modes that the unit is currently in.

MODE 1: Checks tape protection circuit.

MODE 2: Checks tape transport mechanism.

MODE 3: Checks mode switching operation.

MODE 4: Checks control buttons.

MODE 5: Checks capstan motor.

MODE 6: Checks cylinder motor.

MODE 7: Checks loading/unloading operation.

The second and third digits are service data which indicate the condition of the circuit or mechanism being checked.

The forth digit is the service infromation display. it is to be used by the consumer to help determine the source of a malfunction. The service information display operates independently of the service modes and stores the fault indication in memory for as long as AC power is not supplied.

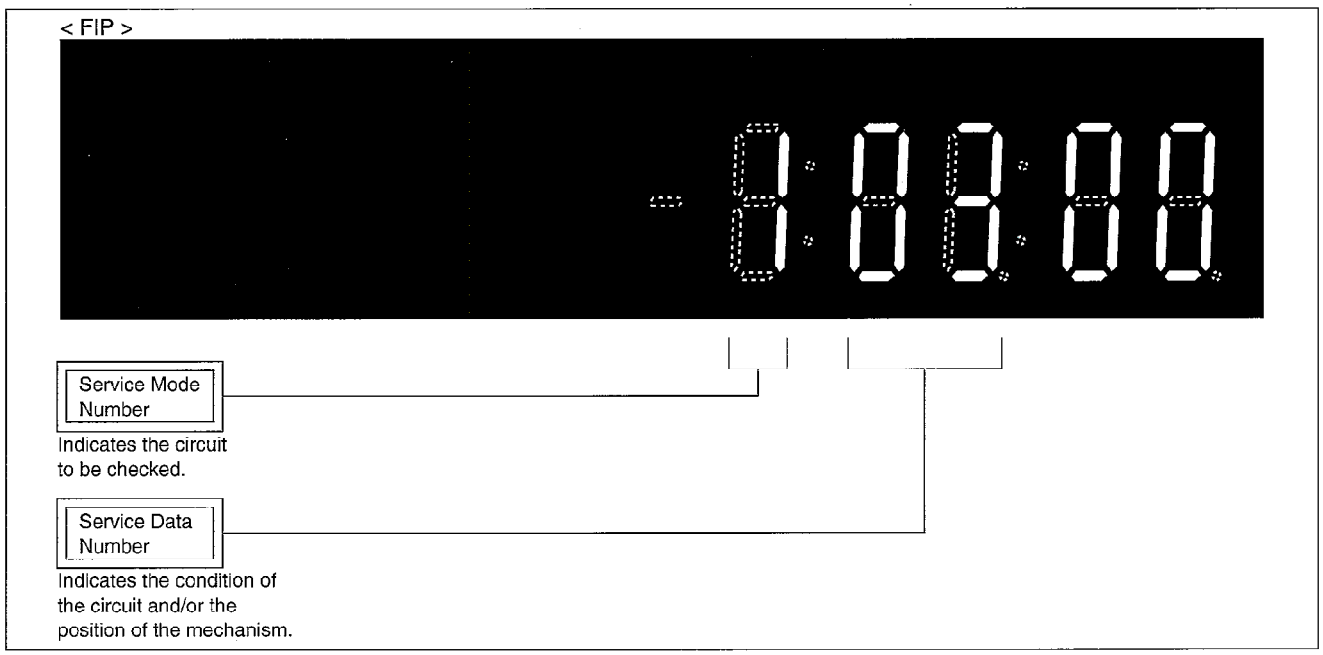

< FIP >
Service Mode Number
Indicates the circuit to be checked.
Service Data Number
Indicates the condition of the circuit and/or the position of the mechanism.

Fig. D2 Service Mode Number and Service Data Number on F.I.P.

7-3. Use of Service Modes

(1) Turn on Service information Display.

(2) To change Service Modes Press FF, REW and EJECT buttons simultaneously.

(3) Mode 0: Not used.

(4) Mode 1: Checks that the sensor LED, Supply & Take-up sensor circuits checks the circuits by blocking the light from the sensor LED to either or both Supply & Take-up Sensors. When the light is blocked to both sensors, "00" should be indicated on the service data number.
When the light is blocked to the supply sensor, "01" should be indicated.

(5) Mode 2: Checks the mode switch circuit while indicating mechanism position.
Service Data Numbers indicate the position of the mode switch and there by the mechanism position.

(6) Mode 3: Checks that mode switch circuit operations have been completed.
Service Data Number should indicate "00" after each mechanism operation is completed.

(7) Mode 4: Checks the operation circuit.
Indicates if SYSTEM CONTROL IC receives the operating commands from the mode buttons and/or remote controller.

(8) Mode 5: Checks the capstan motor circuit.
Indicates if the SYSTEM CONTROL IC has received the command to rotate the capstan motor.

(9) Mode 6: Checks the cylinder motor circuit.
SYSTEM CONTROL IC has received the command to rotate the cylinder motor.

(10) Mode 7: Checks the loading/unloading operation.
The loading motor rotates for loading operation when the "PLAY" button is pressed.
The loading motor rotates for unloading operation when the "STOP" button is pressed.
This mode can be displayed indefinitely until the OPERATE button is pressed.

<NOTE> Refer to Fig. D5 for details of Service Data Numbers.

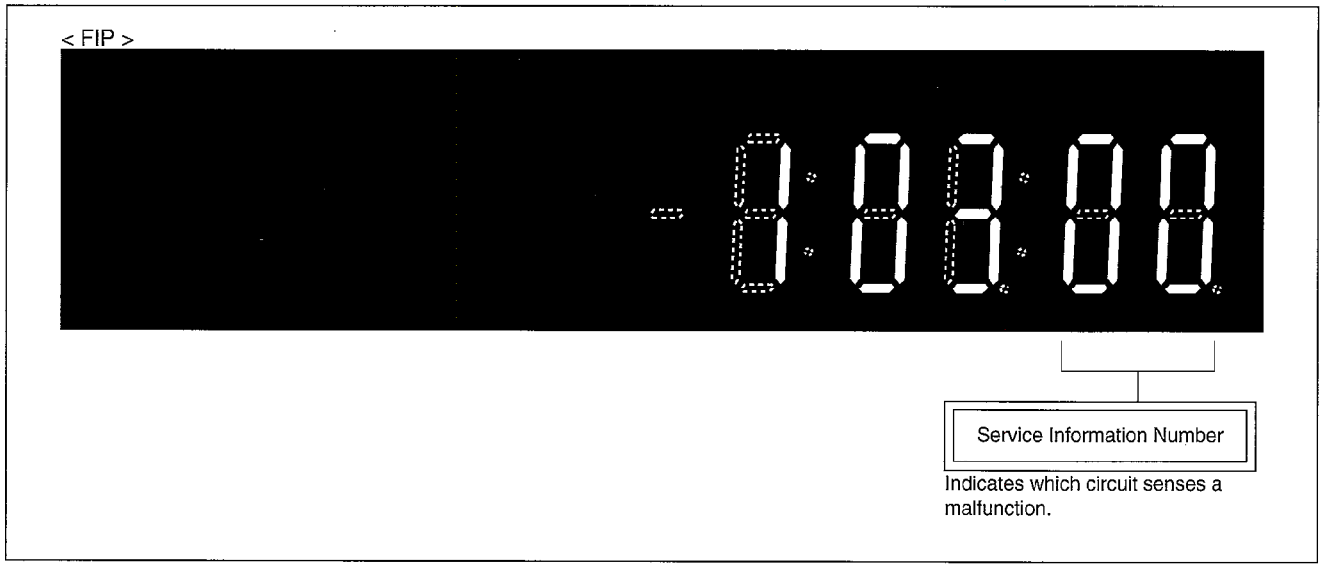


Fig. D3 Service Information Number on F.I.P.

7-4. Service Information Number

Refer to Fig. D4 for details of Service Infromation Number.

NOTE: The Service Information Number display is independent of the service mode display. The Service Information Number will be stored as long as AC power is not supplied (If can be displayed in the Service Mode 2.)

If a second error occurs, only the most recent error will be displayed.

Service Information Number	Malfunction
00	Normal condition (No problem)
01	Cylinder stop
02	Tape reel stop
03	Stop at position other than 04 or 06
04	Stop during unloading
05	Fault capstan rotation
06	Stop during Cassette-in/Eject operation
09	Fault of the main serial communication (Between system control and FIP driver)

Fig. D4 Detail Service Information Number

7-5. Test Mode

When the test terminals are shorted during turning off condition, the following operation will be performed after AC power is applied. Test Mode Information will be displayed on FIP insted of lincar counter.

(1) Power will be turned on automatically when AC power is applied.

(2) The direct operation of buttons are able to be performed.

(Examle) PLAY⟷REC, REC⟷EJECT

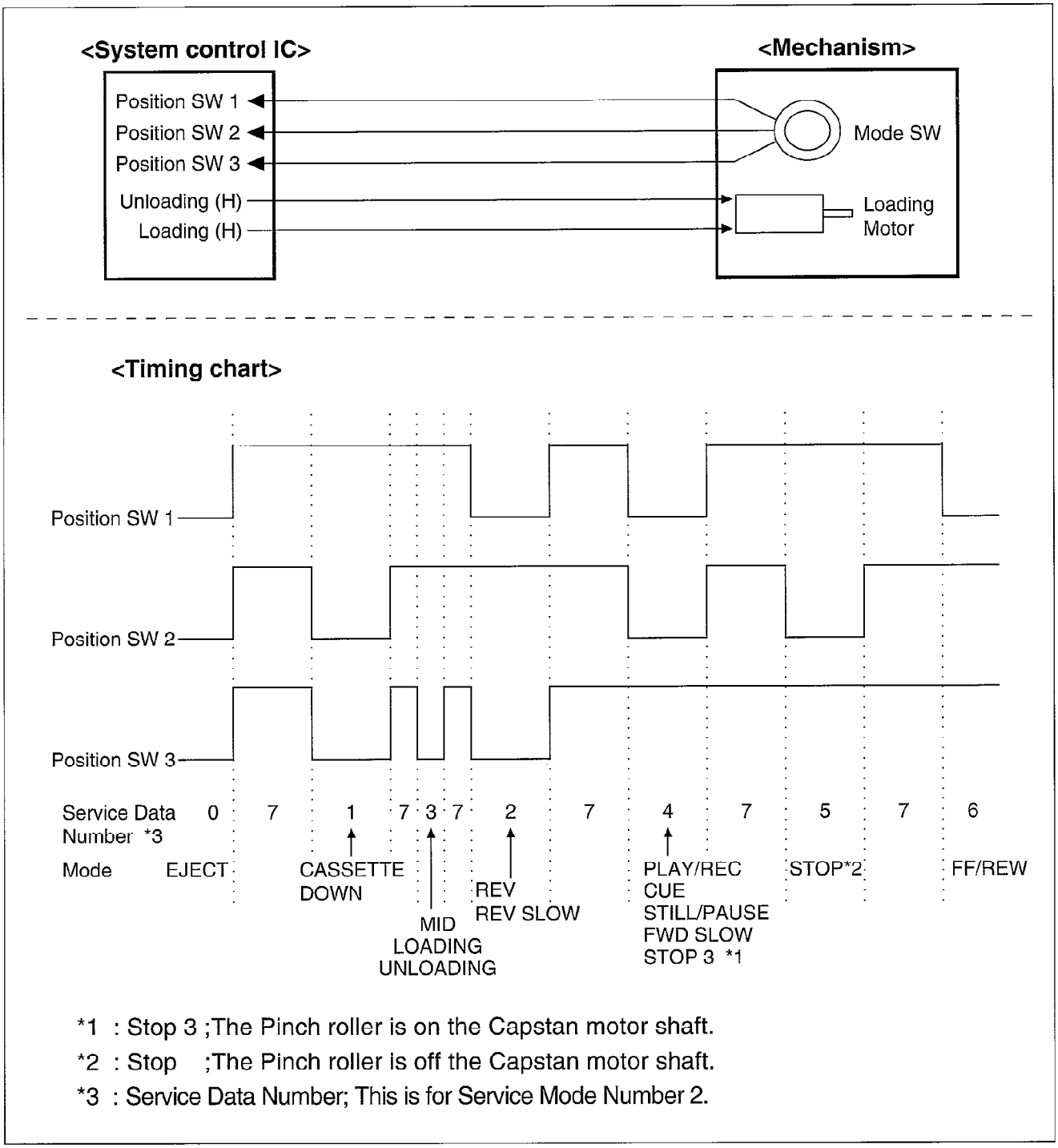
Service Mode Number	Note for checking Service Data Numbers	Service Data Numbers	Indication	Remarks
1	—	00	No light detected at either sensor	Tape not required.
		01	Tape beginning Light to Supply photo sensor is blocked.	
		02	Tape end Light to Take-up photo sensor is blocked.	
		03	Light detected at both sensors.	
2	—	00	EJECT	Tape required *1. STOP3: Pinch roller is on Capstan motor shaft. *2. STOP: Pirtch roller is off Capstan motor shaft.
		01	Cassette down	
		02	REV, REV SLOW	
		03	Loading/Unloading	
		04	PLAY, REC, STILL, PAUSE, CUE, FWD SLOW, STOP3*1	
		05	STOP*2	
		06	FF/REW	
		07	Intermediate position	
3	Disregard service data displayed until mechanism operation is completed. Then the display should indicate "00".	00	Any display other than "00" indicates a fault in the mode switch circuit or system.	Tape required.
4	Display only when the operating button is pressed.			Tape not required.
5	Left digit only, disregard Right digit display.	8 1 Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "PLAY" command received by System control microprocessor.	Tape required. If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated.
	Right digit only, disregard left digit disoaly.	8 7 Left Right Digit Digit	1, 2, 3, 4, 5, 6, 7 indicate that the Capstan motor "CUE, FF, FWD SLOW" commands received by system control microprocessor.	
	Right digit only, disregard left digit display.	8 — Left Right Digit Digit	8, 9, u, A, —, n, L and no display indicate that the Capstan motor "Reverse, REW, Reverse Slow" commands received by system control microprocessor.	
6	Left digit only, disregard Right digit display.	1 0 Left Right Digit Digit	1, 3, 5, 7, 9, A, n and no display indicate that the cylinder motor "ON" command received by system control microprocessor.	Tape required. If a symbol other than those listed is displayed, a mulfunction in that circuit is indicated.

Fig. D5 Service Data Display and Indication

7-6. Timing chart from Mode SW to System control IC

System control IC senses the mechanical position through the Mode SW.

Fig. D6 shows the timing for service mode number 2.



*1 : Stop 3 ;The Pinch roller is on the Capstan motor shaft.

*2 : Stop ;The Pinch roller is off the Capstan motor shaft.

*3 : Service Data Number; This is for Service Mode Number 2.

Fig. D6 Timing chart of Mode SW

8. SYSTEM CONTROL CIRCUIT & MECHANISM CONTROL CIRCUIT

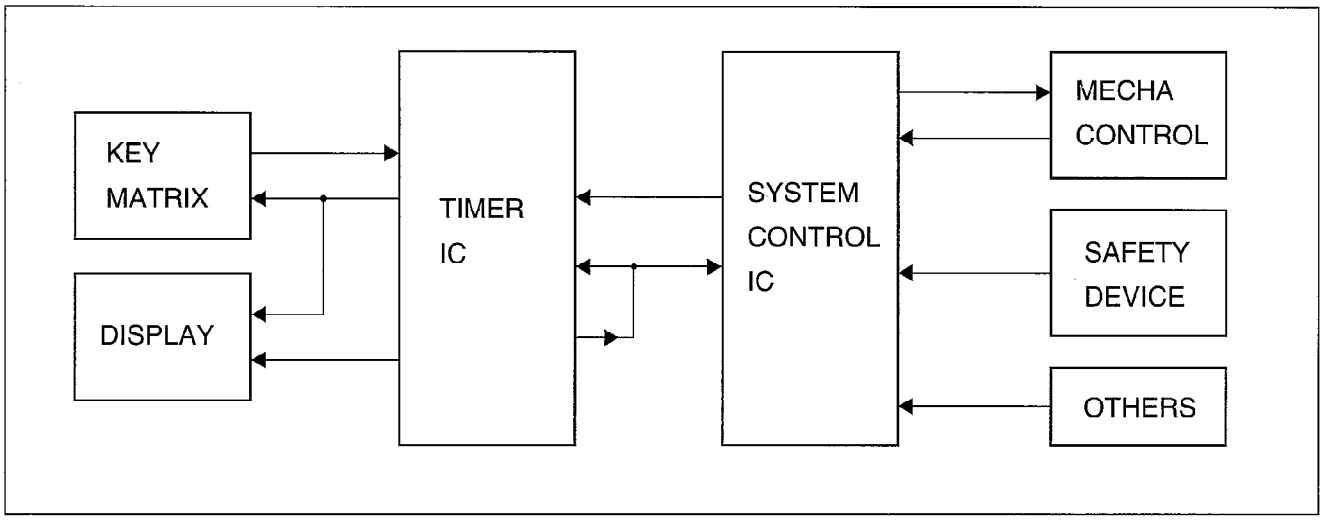


Fig. S1 Overall Block Diagram of System Control Circuit

8-1. STOP3 Specification

(1) The STOP3 is the playback stand-by mode.

(2) The unit is put into the STOP3 position after tape loading if the cassette tape does not have a clear leader tape.

(3) If the unit is in the STOP3 position when the power is switched off (included the Timer stand-by mode), the unit goes to the STOP position.

(4) If the cassette is in the unit when the power is turned on, the unit goes to the STOP3 position.

(5) When the cassette tape has clear leader tape, the unit is in loading mode after winding up the clear leader tape by Take-up reel at the cassette down position and the unit goes to STOP3 position.

8-2. Stand-by in the STOP3 position

(1) The unit goes to STOP3 position when the Stop mode is selected during the Play or Rec operations. The unit then loosens the tape tension by performing the Reverse Slow.
The Reverse Slow corresponds to the FG 40 pulses of the capstan (irrespective of SP/LP modes). The cylinder continues to rotate.

(2) After about 10 minutes in STOP3 mode, the unit shifts to the Stop position and the cylinder continues to rotate.

(3) After about 10 minutes in STOP mode, the unit stops the cylinder rotation.

8-3. Supply and Take-up Sensors

Supply and Take-up photo transistors are used to sense the beginning and end of a tape. The tape has transparent leaders at the beginning and end.

When these transparent leaders enter the tape transport path, they allow infrared light from the sensor LED to reach either one of the tape end sensors (photo-transistor).

If the Take-up end sensor detects the light, the microprocessor SYSTEM CONTROL IC places the VCR in the Stop mode and then performs a short Cue.

If the Supply end sensor is triggered, the microprocessor activates the Stop mode and the Rewind mode. The Rewind mode continues until the Take-up end sensor detects the end of the tape. The tape beginning is detects by a low signal at SYSTEM CONTROL IC Take-up photo terminal. The tape end is detected by a low signal at SYSTEM CONTROL IC Supply photo terminal.

If the light is received at both sensors at same time, the cassette is ejected.

<Operation after detecting the beginning and the end of tape>

Mode	Detection of the beginning	Detection of the end
Power on→off	Short CUE	Short REW
Cassette in	Short CUE	Short REW
Loading	Short CUE	Short REW
FF/CUE	——	Auto REW
REW/REV	Short CUE	——
PLAY, REC	——	Auto REW
SLOW	——	Auto REW
Timer REC	——	Power off

Both ends of tape detection (tape cut, no cassette),

(1) Cassette in: The cassette tape is ejected

(2) Other mode: The unit goes to Stop mode and it is impossible to operate except EJECT key.

(3) Timer REC: Power is turned off after short CUE is performed

8-4. Safety Tab Switch

A recorded video cassette can be protected against accidental erasure by breaking off the tab on the cassette. The cassette can now only be used for playback. To be able to record on the cassette, cover the hole with adhesive tape. If the safety tab on the cassette has been removed, Safety Tab Switch is off (open) and high signal is supplied to SYSTEM CONTROL IC Safety Tab terminal. The SYSTEM CONTROL IC will not go into the recording mode and automatically places the VCR in the playback mode.

8-5 Dew Sensor

If excessive moisture or condensation is present inside the machine (an internal humidity of more than 98%) the unit will stop if running. Until the moisture level decreases only the Eject mode will operate. To sense the humidity, a dew sensor is used. The sensor is a special variable resistor which change resistance with ambient humidity.

The sensor ranges in resistance from about 5K ohm at 90% humidity to about 50K omh at 98% humidity. Normally, the voltage across the sensor is low because of its low resistance.

But if moisture condenses inside the unit, the SYSTEM CONTROL IC voltage of Dew terminal increases to indicate a Dew condition.

Tape	Mode	Dew sensor ON	Dew sensor OFF
OUT	Power	Compulsory Power on	Power off
	Dew indication	Indicate "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette in	Immediately a cassette is ejected after it goes to cassette down position.	Possible
IN	Power	Compulsory Power on	Power off
	Dew indication	Indication "d" and "U10"	No indication
	Cylinder	Rotating *1	Stop
	Key operation	Not possible *2	Possible
	Cassette condition	A cassette goes to down position and is in stand-by mode.	Stand-by mode at STOP3 position.

*1: When the cylinder locks in dew mode, it will be released until dew sensor is truned off.

*2: The keys which do not relate to the tape running operation, are able to be used.

Dew sensor on: During Dew formation is detected and 80 minutes after completion of Dew detection.

Dew sensor off: 80 minutes later after copmletion of Dew detection.

8-6. Setting time for each mode

The time is set on each mode in order to protect tape and capstan driver. When the setting time is over, the mode is gone to the next mode.

Mode	Setting time	Switching mode
STILL, PAUSE	Approximately 5 minutes	STOP
CUE/REV lock	Approximately 10 minutes	PLAY
SLOW, F ADV	Approximately 10 minutes	STOP

8-7. Operation of short CUE

Short CUE stops when the Take-up photo sensor detects the black portion of the tape.

However its sensor does not detect the black portion within 4.0±1.0 sec., the mode except Power on/off and Eject modes will be abe to be operated after the unit stops. This is same as the timer over oeration of the reel lock.

8-8. Loading/Unloading Mechanism lock

Loading and unloading times are set, and in case the mechanism locks during loading or unloading operation within the defined time, the unit detects the mechanism lock and loading motor reverses or stops.

Loading operation lock: Cassette tape is unloaded and ejected within 5 seconds.

Unloading operation lock: Power is truned off within 5 seconds.

8-9. Cassette loading/unloading lock

(1) Mechanism locks during the cassette in operation.

① Cassette tape is ejected approximately 2 seconds later when the mechanism locks during the cassette in operation.

② In case mechanism locks during eject operation, cassette tape is inserted and power is turned off approximately 2 seconds later.

③ When Mechanism locks during cassette in operation, power is turned off approximately 2 seconds.

In case the mechanism lock is released on thc way and cassette is ejected, the unit continues the normal operation.

(2) Mechanism locks during the eject operation.

① Cassette tape goes to cassette down position approximately 2 seconds later and power is turned off when mechanism locks during eject operation.

② Mechanism locks during cassette down operation, power is turned off.

8-10. Reel lock operation

When the Suuply or Take-up reel mechanism locks during the tape running, the following operation is performed.

FF/REW : Unloading and loading. The unit goes to CUE/REV mode.

PLAY/CUE/REC : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

RVS PLAY/REV : Unloading till the cassette down position and loading. The unit goes to STOP3 position.

The reel pulse cycle is started to count after the mechanism mode is fixed.

In case the counted pulse cycle exceeds the defined value, the unit goes to STOP mode due to judge that lock of reel mechanism is detected.

<The value of reel lock detection time>

NTSC/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	±1	3.5
CUE/REV	±5	1.6

PAL/SP mode

Mode	Speed (Ratio)	Time (S)
PLAY	±1	3.5
CUE/REV	±5	1.6

The reel lock time in FF/REW mode is 800msec.

When the tape speed is less than 0.23m/s, reel lock is judged.

8-11. Cylinder lock

<Start rotation>

When the cylinder neither start rotating nor go to the stability rotation within 5 seconds, it is unloading under keeping the mode. In case the cylinder starts operating and stability rotation, the mechanism goes to STOP3 position.

If it is not possible, Power is turned off and cylinder trouble "H01" is displayed.

<During rotation>

The head switching pulse is supplied to the cylinder when the cylinder starts the stable revolution. In case the head switching pulse comes to the cylinder within 0.5 seconds, the cylinder lock is judged and the following operation is activated.

Timer REC: Power off

PLAY, REC: STOP

8-12. Mode transition

The relation between the present mode and operation key is shown in the following table.

PRESET MODE	OPERATION KEY							
	P SW	EJECT	STOP	REW	FF	PLAY	PAUSE	REC
P-OFF	P-ON	EJECT	——	——	——	PLAY	——	——
EJECT	P-OFF	——	——	——	——	——	——	——
STOP	P-OFF	EJECT	——	REW	FF	PLAY	——	REC
REW	P-OFF	EJECT	STOP	REV	FF	PLAY	——	——
FF	P-OFF	EJECT	STOP	REW	CUE	PLAY	——	——
REV	P-OFF	EJECT	STOP	——	CUE	PLAY	STILL	——
CUE	P-OFF	EJECT	STOP	REV	——	PLAY	STILL	——
PLAY	P-OFF	EJECT	STOP	REV	CUE	——	STILL	——
STILL	P-OFF	EJECT	STOP	REV	CUE	PLAY	PLAY	REC PS
REC	P-OFF	——	STOP	——	——	——	REC PS	*1
REC/PS	P-OFF	——	STOP	——	——	——	REC	——

*1: VISS WRITE

Pressing two keys simultaneously, the key operation is going to be ineffective.

In case the unit goes to CUE/REV lock mode by pressing FF/REW key lightly during Play mode, CUE/REV mode will be returned previous mode when FF/REW key is pressed more than 0.7 seconds.

8-13. Power on reset

When the power is turned on, the unit is going to reset and the following datas are cleared.

(1) Position switch data

(2) Operation mode data

(3) Prohibition flags

In case the mechanism is in cassette down position, tape slag is removed as the initial operation and the unit goes to STOP3 position.

8-14. Linear time counter operation

The counter value will be gone up/down by counting control pulse. As for NTSC system during Play/Rec mode, counter value goes up/down every 30 pulses. As for PAL system during Play/Rec mode, counter value goes up/down every 25 pulses.

8-15. Tape speed in CUE/REV mode

	NTSC	PAL
Standard	9 times	11 times

8-16. Automatic functions

(1) Automatic Power on

① Under power off, when a cassette tape is inserted, power is turned on automatically and cassette tape is loaded.

② Under power off and a cassette tape has been inserted, when PLAY key is pressed, power is turned on automatically and goes to PLAY mode.

(2) Automatic play

When a cassette tape removed safety tab is loaded, the mode goes into Play mode.

(3) Automatic rewind

When tape running is reached to the end of tape, automatically goes to Rew mode and stops when tape running will be reached to the beginning of tape.

In case of Timer recording, short Rew is performed for 2 seconds and power is turned off when tape running is reached to the end of tape.

(4) Power off and Eject

Under power off and a cassette tape has been inserted, when Eject key is pressed, a cassette tape is ejected and power is turned off

8-17. CUE/REV lock mode

When FF/REW key is pressed lightly (less than 0.7 seconds) during Play mode, unit goes into CUE/REV mode. To release CUE/REV mode, FF/REW key should be pressed more than 0.7 seconds.

8-18. FR (Forward/Reverse) search mode

When FF/REW key is pressed during FF/REW mode, unit goes into CUE/REV mode.

To release CUE/REV mode, FF/REW key have to be pressed.

8-19 FF/REW speed

Maximum tape speed is approximately 3.0 m/s during the stable running.

8-20 FF/REW time

The tape running from the beginning to the end of T-120 type (E-180 type) cassette tape is able to be completed within 150 seconds.

Panasonic

MATSUSHITA ELECTRIC

Printed in Japan